THE MONTHLY FOR RESELLERS DECEMBER 1997 Vol.3 No.12

Canadian Computer Wholesaler

Home For The Holidays

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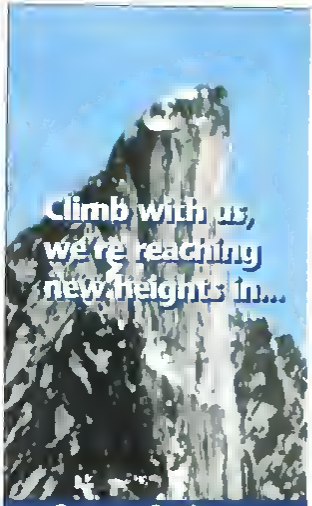
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There's No Place Like Home?

It's a tough market. We're talking super-budget-conscious buyers and fierce competition for tiny margins.

On the face of it, there's still plenty of opportunity. While information technology has taken deep root in businesses across the country, depending on whom you ask, only 41 to 44 per cent of Canadian homes are equipped with a personal computer. What's with the rest? Well, for some, it's the cost. (I'm holding out hope for home-oriented 'Net PCs here.) Other consumers still have a deep-seated fear of technology, and yet others just haven't seen any compelling applications to warrant the investment.

But many compelling applications do exist. From productivity packages, to super PC games, to greeting card software, to Internet research, to Web phones and videoconferencing — so much appeals about the capabilities of today's technologies and the useful and interesting ways they can enrich our lives if properly applied. However, it's still not easy. I had lunch recently with one home-office worker who expressed her frustration with technology. "I tell people I work on the floor, under my desk."

A recent report by market research firm Computer Intelligence said self-employed PC users who operate their businesses out of their homes "have much more demanding needs when it comes to computing systems, software and communications." The study reported that nearly two-thirds of self-employed users' systems have CD-ROM drives, and more than 50 per cent have external speakers or sound boards. It compared that to small office systems, where only 32 per cent of small-office systems have CD-ROM drives and 16 per cent have external speakers. In fact, in a statement, Mark Nelson, vice-president of Computer Intelligence's Consumer Research Group said, "We often hear manufacturers and service providers say they are targeting the SOHO (small office/home office) market with a particular product. In reality, though, this approach is unlikely to be successful. Our research shows that there are significant differences between these two groups in the technology they use and how they use it." For example, the report said self-employed PC users demand much more from their systems, and have more robust configurations. They run more software applications and spent more time on their computers.

Know your customer. Is your potential customer contemplating technology to be used mainly by the children for games and schoolwork? Or are they wanting a system to support bringing work home from the office? Or perhaps both? Or is the machine going to be the central hub for a home-based business?

Consider support for a moment. If a PC is primarily an entertainment device or a convenience, a two or six week repair schedule will be annoying, but likely endurable, for your customer. For a self-employed home-based business worker, even a day without a computer can be intolerable, and can mean lost business.

Plan your support offerings accordingly. If you're truly trying to cater to home business, you ought to be offering on-site repairs and replacement units, for starters. Or if you want to launch technology into homes where no PCs have gone before, be prepared to offer true hand-holding, including full installations and training.

This issue, our Lab Test examines computers specifically intended for home buyers. Please see *"Home For The Holidays,"* (page 42). And note a thorough discussion of computer-input devices by Associate Editor Jeff Evans, in *"Making Contact,"* (page 34).

As well, contributing journalist Alan Thwaits takes a close look at Educational/Edutainment software in *'New Multimedia Blurs The Boundaries Between Learning and Playing'* (page 40). Among those products he highlights is Microsoft's Actimates Barney.

I had a good chuckle in a recent discussion with Microsoft Canada's new president Simon Witts. He was talking about how products sold in Quebec must be available in both official languages. "That's why we don't sell Barney, in Quebec."

"Sorry, why was that?" I asked, intrigued.

"Well, Barney doesn't speak French!" he explained.

Of course he doesn't. What was I thinking.

And what are you thinking? Drop me a line at gracec@netcom.ca.

Happy holidays. CCW

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Column on Intel was good reference material

I was reading through Alan Zisman's October column on Intel's CPU strategy. The section on chipsets is now highlighted, cut out and in my "Tech Notes" file.

As a small VAR consultant who does system installations/integration and some database design, I am very aware of the importance of selecting a proper chipset/motherboard configuration for my clients' systems. This is one of the places that direct-to-customer manufacturers save money, by moving systems with the VX chipset. The business is complicated enough without having to explain to someone why they are getting less when they pay less sometimes.

One chipset you did not mention in this article was the TX chipset. It supports SDRAM, and "Ultra DMA" Hard Drives. With a Pentium MMX or AMD K-6 it really hums along. The pricing is effective because customers can take advantage of cost-effective CPUs, memory and hard drives that are nominally more expensive than the prior generations.

Anyway — enjoyed your article — please keep plowing into the nitty gritty tech stuff!

Douglas Bellamy, consultant
BreakAway Computing Solutions, Courtenay, B.C.
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LETTERS

Canadian Computer Wholesaler welcomes your opinions on current issues in the market, plus your feedback on our publication.

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NEWS

We welcome your ideas regarding news and feature topics for *Canadian Computer Wholesaler*. Feel free to contact the editors directly with your suggestions.

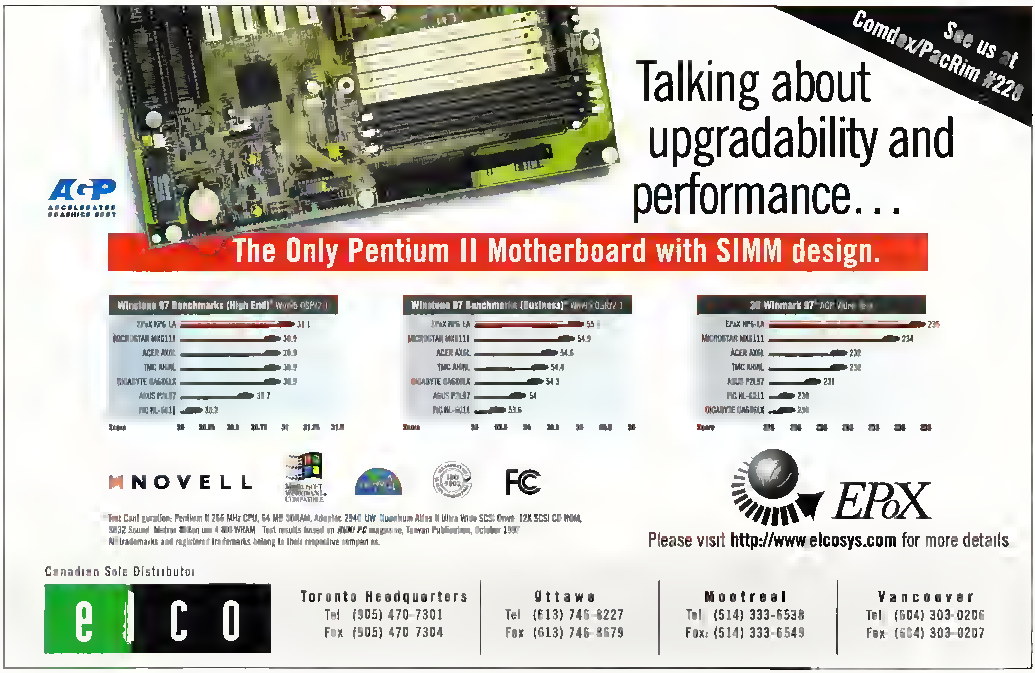
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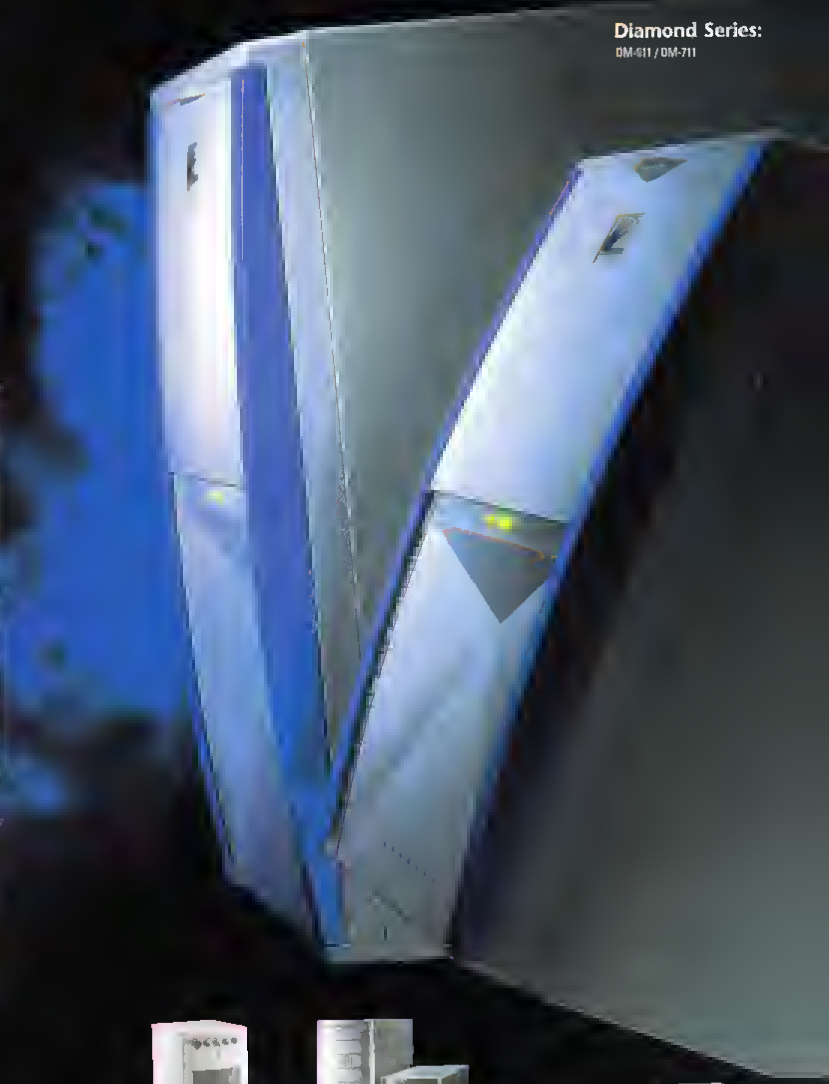






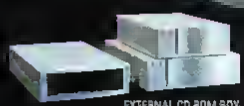







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Apple Computer keeps shaking the tree

(NB) — Continuing his reorganization of Apple Computer, Steve Jobs, interim chief executive officer, announced a new direct sales Internet site, a fundamental change at the factory level with build-to-order sales, and a new series of Macintosh computers based on the PowerPC G3 microprocessor.

Prices for what Jobs called "simply the fastest computer experience today," range from US$1,999 for a desktop system, US$2,999 for a tower system, and US$5,699 for a PowerBook. The PowerPC G3 microprocessor will be available in 250MHz and 266MHz models. Jobs said. "The PowerPC G3 266 outperforms any Pentium II 300 MHz system."

Jobs said the problem with Apple distribution had been at the national reseller level. "Too many people have had a bad buying experience — computers not turned on, salesmen not knowing about the product, and salesmen trying to sell Windows-based machines. The Apple store is the most sophisticated on-line shopping site we know of."

Computer industry analyst Tim Bajarin said the new sales program "would not harm retail computer superstores,' such as CompUSA and other companies which offer both Macs and Wintel-based personal computers. However, stores which offer only Macintosh computers could be adversely affected by Apple's new direct sales program.

Apple has also announced all U.S. reseller distribution will occur through Ingram Micro Inc. and Micro Age Inc., two long-term supporters and distributors of Apple products.

The new plan means Tech Data, InaCom and Merisel will no longer operate in the U.S. as Apple distributors. "TechData will continue to distribute Apple products in our European markets," began Apple spokesperson, Katie Cotton. "Additionally, Merisel will continue distribution in Canada."

And Apple has teamed with CompUSA Inc. to create an Apple "store within a store." Backed by a new Apple management attitude, CompUSA expects to have 40 stores nationwide ready for the upcoming holiday season.

The new Mac store inside CompUSA will be marked by new shelves, signs, employees in different shirts, an aggregation of Macintosh computers, peripherals, and software, and employees specially trained to help Macintosh business and home users.

Sony announces corporate reorganization plan

(NB) — Sony Corp. has announced plans to merge two of its group companies Broadcast Products Company and Image & Sound Communication Co., into the new Broadcasting & Professional Systems Co. and to create a further new company, Digital Network Solutions Company. The changes will take place on Jan. 1, 1998.

"The changes we are announcing will allow Sony to take advantage of the opportunities offered in the digital and networked society, strengthen our core businesses, and offer even better service to all of our customers," said Sony president Nobuyuki Idei, in a statement.

The Digital Network Solutions Co. will oversee digital network-related businesses including electronic content distribution and creation of platforms for digital satellite broadcast and computer networks such as digital satellite broadcast transmission and reception systems. It will take over Sony's production of set-top boxes for digital satellite broadcasting and also work to create new distribution platforms, a company spokesperson said.

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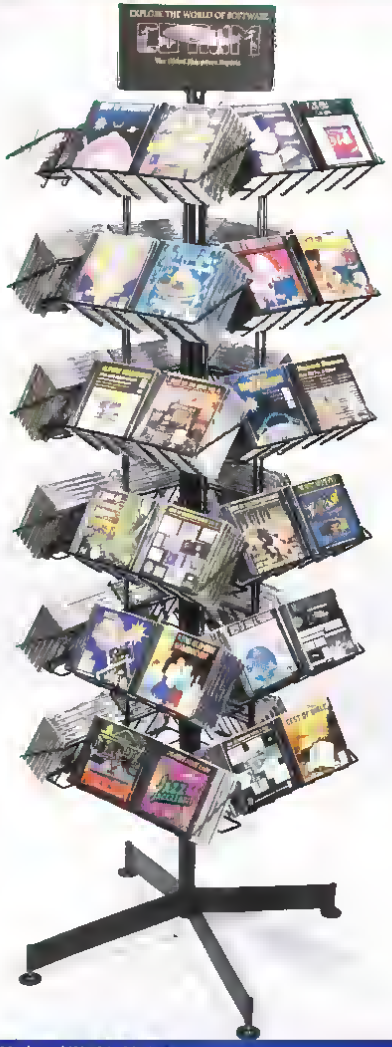
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Mitsubishi aims to grow beyond high-end monitor ghetto

The Mitsubishi group of companies, with more than $200 billion in annual sales, claims to be the largest industrial conglomerate on the planet, and its Mitsubishi Electrical component, with sales of $36 billion, is about Number 36 on the *Fortune* 500 list.

Mitsubishi Electrical makes everything from hard drives to VCRs to supercomputers. Given this world-class scale, it's a bit of a surprise that the Mitsubishi brand name has a relatively low profile in the Canadian computer market. The company OEMs its DiamondTron CRT monitors to Digital and Silicon Graphics, and its flat panel LCD displays to Compaq, among others, but its name brand monitors command a relatively small percentage of the Canadian monitor market.

According to Elan Azar, the head of Mitsubishi Canada's Information Technology division, this is about to change. Mitsubishi has committed to the construction of a US$320 million monitor fabrication facility on the California-Mexico border, and aims to become a more important player in the North American monitor market under its own brand name in the next few years.

According to Azar, Mitsubishi's DiamondTron technology was developed after the expiry of Sony's Trinitron patents opened the way for Mitsubishi to develop its own versions of high-end aperture grill monitors. Instead of copying Sony, however, Azar claims that Mitsubishi decided to make an improved aperture grille product, which has recently culminated in a new 'natural flat' DiamondTron screen.

Mitsubishi has concentrated on the high-end of the monitor market, creating monitors that typically last for more than 20,000 hours of use. Typically, a Mitsubishi monitor outlives two or three of the desktop PCs sitting under it.

Merisel expands MOCA into Canada for Sun support

Merisel Inc. is expanding the Merisel Open Computing Alliance (MOCA) up from the U.S. into Canada.

That division of the company is dedicated to Sun Microsystems and enterprise-class products. This means MOCA training, financial assistance, marketing and business development programs, integration services, and technical support are now available to Canadian resellers.

As well, MOCA provides 48-hour delivery service via FedEx from Merisel's U.S. Sun distribution facilities.

IT certification is highly valued, says new Gartner study

(NB) — Engineers and other technical types sometimes tend to scoff at certification programs, but if a new study is right, those who do the hiring and firing disagree.

The Sylvan Prometric division of Sylvan Learning Systems says a study it commissioned found the value put on certifications at the corporate level is at an all-time high.

Sylvan Prometric, Sylvan's computer-based testing division in Baltimore, commissioned the study from the Gartner Group. Gartner's findings and recommendations tend to be closely watched by information technology (IT) managers and corporations in general.

The findings, released at the recent Results '97 trade show on technology-based assessment now under way in San Antonio, were compared with those of a similar Gartner study made three years ago.

Just as managers were more likely to require certifications this year, IT professionals were more likely to seek them, said Sylvan. According to the study, the number of IT professionals seeking multiple certifications has crossed the 50 per cent mark, rising from 44.3 per cent to 68.8 per cent. This increase was reflected in the increased number of IT professionals who have sought certifications specifically to advance their career, a number that rose from 46.6 per cent to 52 per cent.

Toshiba worldwide notebook sales pass 10 million

TOSHIBA

(NB) — Toshiba Corp. says it has become the first notebook computer maker in the world to pass the 10 million mark for cumulative shipments.

Shipments began in 1985 with the T-1100 series laptop computer in Europe. It followed, in 1986, with the launch of the T-3100 series machines in North America and Europe and the J-3100 series in Japan. Its Dynabook range, launched in Japan in 1989, marked another important step in the company's portable computing history.

As prices and physical sizes have fallen in recent years, and technology has grown, the rate of sales has picked up.

Toshiba passed the five million cumulative shipments mark in 1995, after 10 years on the market. The recent announcement marks a doubling of that number in just two years. CW

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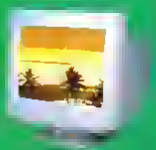
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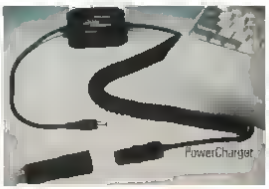
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Airplane travelers plug in

Ever Corp (Canada) Ltd of Toronto, say travelers on overseas flights can tap into more battery power with The PowerCharger The portable power cord lets airline passengers plug into socket (installed on selected overseas flights)

The PowerCharger is priced at $124 95 and is available in 20 models for various notebook brands An adapter lets the cord be plugged into a cigarette lighter in a car or boat



Canadian ISP market consolidates with purchases of IStar, Hookup

Over the space of a couple of weeks the Canadian Internet Service Provider (ISP) community became noticeably smaller as U S -based PSINet bought out iStar, a big but troubled Canadian ISP for about $35 million, and Netcom Canada bought a large part of the subscriber base of Hookup Communications for an undisclosed sum The two acquisitions are further evidence in support of analysts' claims that the Canadian ISP market is increasingly becoming split between a shrinking band of large players (such as America Online, Sympatico, Netcom Canada and PSINet) and a host of generally very small or specialized ISPs many of whom serve small communities or remote areas where the major companies have no local dial-up point of presence (POP)

A PSINet representative confirmed that iStar with 200 employees and about 66 000 individual and 1,300 corporate subscribers, would be merged with PSINet's Canadian organization which has about 80 employees PSINet specializes in corporate Internet networking and secure electronic commerce services, and sees the acquisition of iStar as a 'good fit' with the company s existing customer base and technical infrastructure

iStar which was quickly built in 1995 through the acquisition of a number of smaller ISPs, was Canada s largest ISP but had continually lost money in recent quarters. Part of the deal for iStar's acquisition by PSINet included an immediate cash payment of $5 million dollars to support iStar's current operations, leading to speculation that the company had been in difficult financial shape at the time of its sale

Like iStar, Hookup Communications also had a history of buying market share by acquiring smaller ISPs, and similarly seems to have had trouble managing its debt and making a profit In the case of Hookup, however, according to Netcom Canada's president Ron Close Netcom is simply taking on about 13 000 of Hookup's subscribers, and helping them to transfer their accounts to Netcom if they so wish.

For more information contact http // www.netcom ca/press or http //www.psi.ca.



Digital Canada has build-to-order plan

(NB) — Digital Equipment of Canada Ltd says it will focus on build-to-order capabilities at its plant in Kanata, Ont

DEC Canada said it will build personal computer products in response to orders from resellers, rather than trying to anticipate demand The company is promising resellers five-day turnaround and said the new plan will reduce the amount of inventory resellers need to keep on hand

Corel Corp. names design contest winners

(NB) — Corel Corp has named nine top winners in its annual World Design Contest The US$250 000 top prize, Best of Show in the graphics category went to Hans Joachim Cardinal of Germany, who also won grand prize in the Landscapes and Landmarks category

Other grand prize winners in the graphics categories were David A Huss of the U S , in the People, Plants and Animals category, Ron Richey of Canada, in Corporate Identification, Simone Pampado of Italy in Technical Drawings, and Daniel Seed of Canada in the Abstracts category In the publishing area, grand prizes went to Huan Le Tran of Canada for Corporate Communications. Brent J. Beverly of the U S in the Third-Party Solutions category, and Mark Leany, also of the U S , in the Macros category The winning images are available at http //www.corel com/contests/winners97

Supercom and D-Link combine on discounts

Supercom Canada has struck a deal with D-Link Network and says resellers can expect additional discounts on D-Link networking products when they re integrated into Supercom systems

Supercom's Howard Rotenberg product manager for networking products commented, in a statement "Supercom is saving money because of bulk packaging and volume purchasing and it makes sense to pass these savings along to our dealers" CCW



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Technology lovers flock to annual Vegas gathering

by Grace Casselman and Jeff Evans



For the keenest technology players and watchers, nothing quite matches the lure of the annual November pilgrimmage to the desert. Indeed, as many as 250,000-strong, they marched on Las Vegas for six days of crowds, line-ups, rhetoric and the occasional innovation.

More than 2,100 exhibitors participated, with key technologies including ultra-portability, powerful PCs and servers, Internet and intranet products, networking, multimedia and voice recognition.

From industry leaders, proclaiming fondness for technology seemed particularly popular this year. In his keynote address, Bill Gates, Microsoft CEO, undertook the theme "Why I love my PC." He went through a Top 10 list on that subject, including a reference to his ongoing dispute with the U.S. Justice Department. He claimed his PC let him collaborate with lawyers around the world to creat a 40-page brief on the dispute.


Bill Gates loves his PC

"If there's anyone who loves PCs more than Bill, it's me," said Eckhard Pfeiffer, president and CEO of Compaq Computer Corp., noting in his own keynote that Compaq has sold more than 35 million PCs.

"The greatest battle is not direct versus indirect," he commented. "It's which company can provide the right bundle of products, solutions and services to customers."

"What is so special about Comdex?" asked Jason Chudnofsky, president and CEO of ZD Comdex & Forums. "It's a regathering of the industry — a place to put things in perspective."

Tom Cosgrove, director of marketing for AccountMate Software Corp., in Mill Valley, Calif., said show attendees now "qualify themselves more" than in earlier years, looking specifically for the solutions they need. (The Canadian subsidiary of AccountMate is called SourceMate (Canada) Inc., but Cosgrove said that name should change to AccountMate later in 1998.) Target markets for the accounting products are companies with between two and 150 employees, and AccountMate is looking for additional resellers, said Cosgrove.

Tom Reeves, president of Merisel Canada has been attending Comdex for 11 years. He says the show's all about "meeting people and furthering business relationships."

North American Strategy

Reeves added: "It's a good opportunity to showcase Merisel North America." He referenced the recent expansion of the Merisel Open Computing Alliance (MOCA) division of the company into Canada. That Merisel division is focused on Sun and third-party enterprise products.

He explained that Merisel is working to more tightly integrate the Canadian and U.S. businesses, including practices, partnerships and systems.

While speaking to *Canadian Computer Wholesaler* at Comdex, Reeves said he expects to see Merisel Canada make further inroads into both build-to-order and configure-to order, in 1998.

Micrografx also spoke of the "North American market," at Comdex. Last summer, that company closed its Canadian office and pulled those sales and marketing efforts back into its Richardson, TX-based office. "With a North American strategy, we've erased the border and seen growth," said Chad Riseling, director of channel sales.

Micrografx was preparing to launch its Graphics Suite 2 Enterprise Edition, which promises to ease administration and total cost of ownership in a network environment, said Darryl Worsham, general manager, enterprise sales. The product is priced at US$349.

Corel Video NC

Corel Computer Corp. was showing Corel Video Network Computer which it is starting to ship to third-party developers. The video-ready NC runs a Java virtual machine. It will sell for about US$1,000, said Oliver Bendzsa, spokesperson for the hardware subsidiary of Corel Corp.

Windows CE

Microsoft was proudly exhibiting the Windows CE 2.0 operating system, supported by a number of hardware vendors with new handheld offerings and prototypes. CE 2.0 offers such significant new features as support for larger and color screens, printing and VGA-output, to allow for presentations onto larger external displays. Numerous other modifications include enhancements to ease-of-use and readibility. True Type fonts, automatic synchronization with two PCs (both home and office, for example), support for E-mail attachments, and the ability to run PowerPoint presentations, said Douglas Dedo, group product manager for Microsoft's consumer applications marketing staff. Microsoft won't release totals on Windows CE sales, but said just one of the eight hardware partners sold more CE handhelds than the Newton in its first year. Three-quarters of buyers are business users, and 250 packaged applications are available, said Dedo.

Compaq, for example, introduced the Compaq C-Series PC Companion, based on Windows CE 2.0. It includes an integrated modem, a color or monochrome display with 640 by 240 resolution, and two brightness settings for the backlighting.

Most CE handheld manufacturers are preparing to ship upgrade modules to allow current CE owners to access the new software features. CCW



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Digital And Intel Kiss And Make Up, For US$700 Million

by Jeff Evans



During the summer of 1997, the computer industry was treated to the surprising spectacle of Digital Equipment Corp. and Intel Corp., two of the computer industry's giants, firing lawsuits at each other over allegations of copyright infringement.

Intel, the fabulously rich company whose Pentium chip family is the dominant line of central processing units (CPUs) in the global personal computer market, stood accused of lifting several key technologies from Digital's Alpha chip and incorporating them in its Pentium II chip. Digital alleged Intel violated 10 specific patents, including such concepts as high-speed instruction processing, cache management, and branch prediction-all key to superior CPU performance.



Digital's CEO, Robert Palmer, radiated indignation as he spoke about Intel executives boasting about how they had profited from other companies' ideas. Digital's claims for damages included an injunction against Intel selling any Pentium chips containing disputed technology, plus unspecified payments.

Intel responded with a countersuit alleging Digital infringements on Intel patents, and threatened to play hardball with Digital by cutting off the flow of Pentium chips for Digital's own PC line. The stage seemed set for an interminable lawyer-fest, on the scale of the Microsoft-Apple dispute, which was only settled this fall by Microsoft investing in Apple and agreeing to pay unspecified licensing fees.

So, it came as something of a surprise when on Oct. 27, 1997, Digital and Intel suddenly announced an amicable settlement to the dispute. The agreement amounts to an extensive, long-term strategic partnership between the two companies, including: the sale of Digital's semiconductor manufacturing facilities to Intel for about US$700 million, a 10-year cross licensing of patents between Intel and Digital, and, Intel's agreement to manufacture Digital Alpha chips.

According to Digital's Palmer: "This agreement brings issues between the two companies to a resolution that benefits customers in many important ways. It ensures long term availability of Digital Alpha based offerings for Open VMS, Unix and Windows NT customers. In addition, Digital will develop Digital Unix and Windows NT offerings on the (Intel Architecture) IA-64."

Much of the apparently genuine sense of hurt and grievance that Digital executives expressed when launching the original suit against Intel seemed to have been based on frustration that after Digital's huge investments in Alpha technology, an Intel 'clone' of that technology was winning in the market-place.

To rub salt into the wound, the Digital Alpha chip is technically superior in some ways to the Pentium chip family, and the Alpha is universally recognized as faster and more desirable for high-end applications such as computer aided design (CAD), and 3D simulation and data modeling. However, in spite of some success with Alpha, Digital could never crack the armor of the Windows/Intel juggernaut.

The new agreement indicates that reason has prevailed over passion at Digital, and the company has made what seems to be the best deal possible under the circumstances. For Intel, in a fashion similar to Microsoft's settlement with Apple, a sizable cash payment to Digital has also bought tangible benefits for Intel, and cleaned a potentially messy legal dispute off its plate.

Digital has made a statement on doing business in the '90s: hurt feelings are one thing, the bottom line is another. For more information see http://www.digital.com or http://www.intel.com/pressroom. CCW

Jeff Evans is Associate Editor of Canadian Computer Wholesaler. He can be reached at jeff@tcpon.com.

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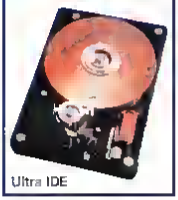
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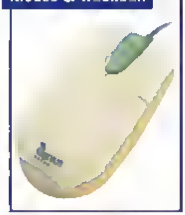


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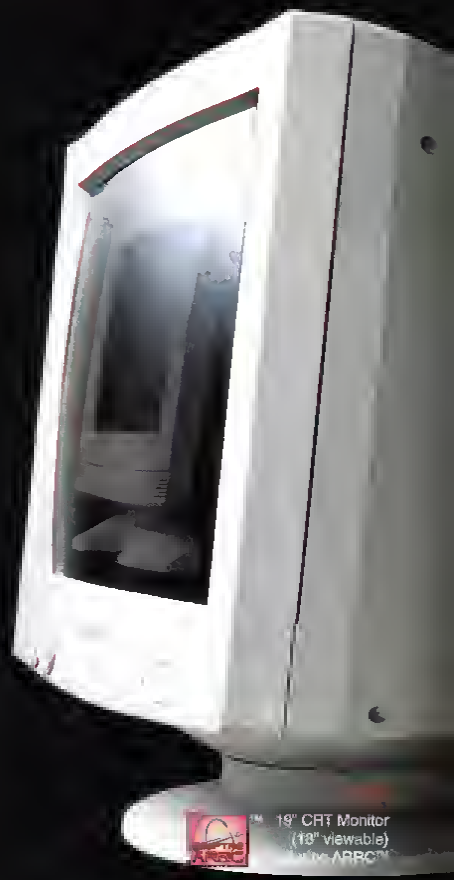
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How Widespread Is Service Fraud?

by Dan McLean

Canada's computer technical service industry is about to get a wake-up call from an industry association dedicated to raising the bar of professionalism, as the Computing Technology Industry Association (CompTIA) based in Lombard, Ill., has officially opened its doors in Toronto.

Consumer skepticism about the computer service industry may have been heightened earlier this summer during an NBC's *Dateline* news magazine show which sought to uncover computer service fraud and negligence by bringing computers with known problems to various repair centres. At least one major outlet failed the test, citing the need for additional repair costs and replacement of parts on a computer that *Dateline* maintained were fully functional.

CompTIA represents more than 6,000 computer resellers, VARs, distributors, manufacturers and training companies in the United States and Canada and provides CompTIA professional certification among service technicians. The goal is to ensure consumer confidence in computer service facilities and professionals.

"Are there problems out there? Yes," says John Venator, CompTIA executive vice-president and CEO. "Do I wish they weren't there? Certainly. Where do they tend to be? They tend to be in more major metropolitan areas."

According to Venator, home users and SOHO businesses are typically the victims of computer service fraud simply because they are less knowledgeable about their computers. While he perceives problems brewing in the computer service field, he admits having no hard evidence, only his own observations of what he has "seen and heard." However, his view of what may be happening in the industry isn't consistent with what others see. An informal polling of resellers and service outlets in the Toronto area revealed virtually no concern. "We haven't had any complaints about different people or other stores (that may have committed computer service fraud). I don't recall anything," says Stan Brak, a technician for Compumemories in Toronto.

Mohamed Dhanji, owner of Hi-Tech Electronics in Toronto, concurs, saying he doesn't see computer service fraud as a significant problem in the industry, at this time.

But CompTIA's Venator contends consumers are expressing concern and want to learn how to protect themselves against computer fraud. In fact, a recent pamphlet entitled *Making The Right Connections — How to Find a Reputable Computer Reseller*, was a joint CompTIA/BBB effort. "The Better Business Bureau approached us and says, 'One of the major areas we get calls on all the time is (from consumers) who want to know where they should go to get computer service,'" Venator says. Approximately 800,000 of these brochures have already been distributed.

Venator believes CompTIA's A+ certification program for technicians will provide some degree of assurance for consumers. The A+ certification exam tests competency in technologies ranging from microcomputers to displays, storage media to printers, operating systems, modems, buses and CD-ROMs.

Venator claims A+ certification is gradually being recognized as a standard of excellence in the United States.

CompTIA membership also provides a degree of consumer confidence, he adds. CompTIA has a code of ethics and standards for its members which are enforced and those found guilty of computer fraud can lose their memberships.

"We want much more of a specific presence in Canada as our Canadian membership grows," Venator says. "We want to be able to service Canadian members better — by Canadians, for Canadians."

CompTIA may have its work cut out since none of the Toronto area service outlets contacted had even heard of the association. Some, like Hi-Tech owner Dhanji, even believe an association like CompTIA is not needed.

Others, like Brak, suggest that common sense may be the industry's best regulator. "You have to give good service because a customer won't come back if they're not satisfied," he says.

For information about CompTIA in Canada, visit the CompTIA Web site at http://www.comptia.org. CCW

Dan McLean is a Toronto-based journalist who specializes in high-technology reporting.

CompTIA's checklist: Do you measure up?

CompTIA recommends that customers employ the following checklist to select a reputable reseller.

Longevity in the market-place: If a reseller is well established, it is more likely that the company will be around to handle future questions, service needs and upgrade plans.

Reference checks: Can the reseller provide a list of satisfied customer references?

Quality of service: Do the reseller's stated marketing mottoes match the services they actually provide?

Manufacturer authorizations: Has the reseller installed and/or does it use the specific kinds of equipment that are being proposed to the customer?

Certification: CompTIA advises that a reseller who has certified computer service technicians on staff is showing customers a commitment to computer service quality.

Support questions: How much of the system being configured does the customer want the reseller to support? Can the reseller support this platform with in-house personnel or by outsourcing? Remember too, there is no such thing as "free technical support." It is invariably tied into the cost of the computer, CompTIA tells users.

Level of rapport: What will be the rapport level between the reseller's support personnel and the employees in the end user's organization? An adversarial posture can cause problems within the customer's company, says CompTIA.

Service: Does the reseller service equipment in-house or do they send it out?

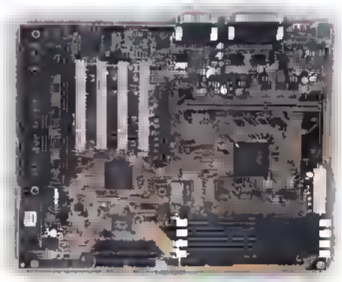
Resources: Can the reseller commit the resources necessary to bring about the proposed solution in the time frame agreed upon?

Extended manufacturer warranties: Many warranties are only for a year. Can the reseller extend them?

Outside help: Can the reseller bring in vendor resources if necessary to complete the projects in the same timely fashion?

Industry commitment: Does the reseller actively participate in computer technology societies or associations demonstrating the company's familiarity with developments in the industry at large?





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Comtronic Celebrates 10 Years of Growth

by Jeff Evans

Markham, Ont -based computer distributor and manufacturer Comtronic Computer Inc celebrated 10 years of uninterrupted growth in late October, with the dedication of its new 53,000-square-foot facility in Markham, Ont

In the last decade, Comtronic has grown from about $1 million per year in sales, to more than $170 million, placing it high in the middle tier of Canadian computer distributors

The opening of the new facility was attended by numerous dignitaries, including Markham mayor Don Cousens, and Ontario's minister of consumer and commercial relations, Dave Tsubouchi

Comtronic founder and president John Tse arrived in Canada in 1978, and after studying computer-related subjects at the University of Ottawa and York University, he went to work learning PC sales for a Toronto-based company called Futuretron He quit that to start his own company, Comtronic, in 1987

Comtronic began as a firm which bought computer components from Canadian distributors and resold them to local PC makers and resellers In 1989, Tse began to import components directly from Taiwan, including product brand names such as Animax (still a supplier to Comtronic), Surtek and DataExpert. Comtronic also began to sell PCs, often to consultants or dealers specializing in niche market solutions such as CAD, construction and architecture

As Tse and Comtronic gained experience, they also gained a good reputation in the industry, and began to sell to superstore customers such as Costco and Future Shop Tse's philosophy of business was shaped during by this early period "It was very tough to climb in this competitive market You really need to take care of the customer, to treat the customer as an associate If the customer prospers, we prosper." Tse concentrated on maintaining long-term relationships with both suppliers and customers, avoiding carrying too many lines of products in favor of concentrating on a few good lines Tse worked hard to develop sales of new suppliers' products "When you deal with a supplier it's never just about price You have to look beyond one quarter If you have a bad quarter of sales (with a particular supplier's product), find out why and make it better"

Comtronic moved to its bigger location to accommodate the company's ongoing growth The new Comtronic facility includes production capabilities of up to 400 PCs per shift, in addition to warehousing, sales and service space Tse expects Comtronic to grow along with the overall Canadian computer market, "for sure, the 1998 market will grow 10 to 15 per cent"



Don Cousens, mayor of Markham region, with Gordon Landon, regional councillor for the city of Markham and John Tse, president Comtronic Computer Inc

The company has 150 employees Comtronic distributes its own Comax PC line, as well as computer components, peripherals, network hardware, and software from more than 50 vendors Those include Acer, ATI Technologies, Daewoo Electronics Canada, Dual group, IBM, Surecom Network, Aceex, NEC and Western Digital Comtronic sells to 1,800 resellers and also has offices in Hamilton, Ottawa, Vancouver, Montreal, and Dartmouth, N S

Tse claims that trends in 1998 will include a big switch to the Pentium II processor, PCs based on the new modular motherboards, and possibly a growing acceptance of DVD in the consumer market

Tse has been active with the Canada Chinese Computer Association "since day one," and refers to it in family terms "This is my baby," he says

Jeff Evans is Associate Editor of Canadian Computer Wholesaler and can be reached at jeff@tcpon com

CCCA Charitable Foundation Holds 4th Annual Gala

The Canada Chinese Computer Association held its fourth gala on Nov 1, with hundreds of representatives from the Canadian computer industry in attendance at the bowling tournament and dinner that comprised the event.

Rex Tsang, of Althon Inc , the president of CCCA, and Frank Luk of Supercom, the event chair, presided over the dinner, where donations were made on behalf of the CCCA to World Vision Canada, to provide plastic surgery for facially deformed children in China, and to the Yee Hong Centre for Geriatric Care in Scarborough, Ont.

Numerous computer vendors supplied technology products for the Silent Auction that took place at the dinner The CCCA has established a Charitable Foundation to disburse funds raised by the CCCA to appropriate charities in an organized way According to Luk "Worthy charities such as World Vision Canada and Yee Hong Centre for Geriatric Care are in need of our financial contribution Through the CCCA Charitable Foundation, we can and have been able to make a difference in our community and beyond, and we are committed to continue with our work, so that we can do even more for humanity in the future"

With the establishment of its Charitable Foundation, the CCCA has expanded its role in Canada from what was originally a purely business-oriented association, to an organization that personifies good corporate citizenship, and humane involvement in society.





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Column

Sub-Notebooks: Déjà Vu All Over Again

by David Tanaka



IBM ThinkPad 560



The sub-notebook category has gone through fits and starts over the years, bouncing in the court of industry opinion between technology darling and developmental dead-end.

A few years ago sub-notebooks — portables that were lighter and of smaller dimensions than standard notebook computers — were in. Hewlett Packard's OmniBook, the first Windows computer you could almost fit in your pocket, led the way. Later, IBM had a sub-five-pound 486-based portable in the ThinkPad 500 series, Compaq took a shot at the market with its Contura Aero series, while Toshiba added the Portege line. While nowhere near the pettiteness of the original OmniBook, these were shrunken design variations of the standard six-to-eight pound notebook computer, being lighter as well as smaller.

That also meant that the screens were smaller, the keyboards were more cramped, and the floppy was external. While lighter was good, smaller wasn't. It seems that not many people were content peering into a seven-inch screens or typing on keys that were 90 per cent of what they were used to on their desktop machines.



Toshiba Portégé 300CT

So the development philosophy split. IBM and Compaq went one way, while Toshiba and HP stayed with the shrunken notebook concept. Toshiba has continued with the smaller form in its Portégé line of portables, and although the Portégé 660 is no longer as light as it once was, Toshiba's Portégé 300 gets closer to the original conception of the sub-notebook, weighing in at 3.7 pounds.

While Hewlett-Packard uses the OmniBook name for all its portables now, it still has the OmniBook 800, whose design remains true to the original almost-pocketable Windows machine. The latest variation has a 166MHz Pentium MMX processor and squeezes a 12-inch screen in the small case.

Thinner And Wider

For IBM, the ThinkPad 701 "Butterfly" series (remember the expanding keyboard?) was an attempt to put a standard-size keyboard into a sub-notebook frame. The keyboard proved reliable but too expensive to produce, and eventually, IBM abandoned the smaller-than-normal case dimensions altogether. The ThinkPad 560, which replaced the 701, was of normal notebook dimensions, at least in terms of width and depth — although it was significantly thinner (1.2 inches) and lighter (4.1 pounds) than standard notebooks. With the 560, IBM seemed to take the philosophy behind Digital Equipment Corp.'s HiNote Ultra to new levels of thin. The latest HiNote Ultra 2000 is around five pounds and 1.25 inches, but unlike the ThinkPad 560, it will accept a CD drive via a swappable bay.

And, even thinner, lighter designs are coming. In September, Mitsubishi and Hewlett-Packard announced a joint project to develop what they bill as "the industry's thinnest, lightest notebook computer." The companies previewed a three-pound "concept" model with an Intel 233MHz Mobile Pentium CPU with MMX, a 12-inch TFT screen and a magnesium housing. The product will be available in North America and Europe under the HP brand in early 1998 and in Japan in late 1997 under a Mitsubishi brand. How thin? Would you believe 16 mm (0.63 inches)?

The Enigma Of Libretto Et Al

The lessons of the Compaq Aero and IBM TP501 seem to be that people don't want small screens or small keyboards. Thin and wide are the flavors for today. But, it seems some part of the market has suddenly fallen in love with tiny computers again. Toshiba has apparently been pleasantly surprised by the popularity of the two-pound Libretto 50CT. It recently introduced a new variation, the Libretto 70CT. The new model has a Pentium 120MHz processor with MMX, along with a bigger (1.5GB) hard drive. It's still under two pounds and measures 8.3 by 4.5 inches, but it still also has the tiny (albeit bright) six-inch active-matrix screen and baby hands-only keyboard.

More than a year ago, I saw Mitsubishi previewing a modular sub-notebook called the Amity. Now, in the U.S. at least, Mitsubishi's Mobile Computing Division has introduced the Amity CN. The unit weighs about 2.5 pounds, measures 9.3 by 6.7 inches and is powered by a Pentium 133MHz processor. A spokesperson with Mitsubishi Electric Sales Canada Inc. says the product will be available in Canada in 1998, but only in limited quantities, likely through VARs.

What these models offers that the 486-era sub-notebooks didn't is significant weight reduction to offset the cramped ergonomics. Having lugged a sub-notebook around for a couple of years, I know that a 4.5 pound computer is still heavy at the end of the day. Moreover, when you throw the separate 3.5-inch disk drive and a portable CD-ROM drive in the shoulder bag, you'd be just as far ahead with a regular laptop.

At least with a regular laptop, you don't have to assemble your computer modules just to copy a file to a floppy, and you have a decent-size keyboard and screen. But at two or two-and-a-half pounds, I think I'd be willing to put up with a lot more ergonomic limitations. CCW

David Tanaka is a Vancouver based journalist and Editor of The Computer Paper. He can be reached at david@tcp.ca

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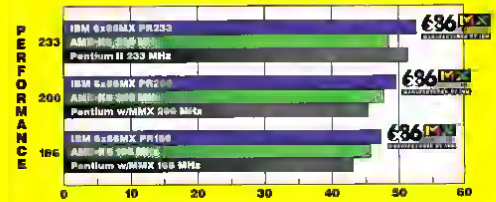
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Pentium II configurations use the Intel PC440FX Independent - otherwise they are the same

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Forecast: 1998

Industry watchers point to portables, networking, document-handling and knowledge products and services as the hot segments in the New Year.

by Paul Lima

Predicting the future can be nearly as difficult as in the past. Try answering these questions: When was the telephone invented? Who won the War of 1812? While you may have answered "Canada" to both questions there are those south of the 49th parallel who would vociferously disagree.

When it comes to interpreting the past or predicting the future, context is everything: your thoughts depend on the prism you keep. Or, in the case of the industry representatives who helped compile these fearless technology forecasts, the company you

If there is anything that connects the future of the past, it's change. And, because the pace of change resellers need to "specialize" if they "hope to thrive," (jestill@hookup.net), CEO of EMJ Data Systems in

Networks Rising

Industry watchers say there will be a tremendous d who specialize in integrating evolving networking technol porations and small businesses.

Alex Delislie is president and CEO of Montreal-based DMT Technology Group (Canada's fourth largest VAR and systems integrator). DMT specializes in fully integrating networking solutions across enterprises. "To add value, VARs need to look at increasing professional services," says Delislie.

of marketing at Bay Networks Canada Inc. in Toronto concurs. He says that have been at length for years. "Like multi- began to see deployment through

combined with routing switch technology, will ons through to 2000." Gnass the switch will displace the LAN backbone th traditional backbone routers serving WAN requirements exclusively.

te about whether 1998 will be a breakthrough uter (NC) or the Network PC (NPC), but the both technologies will make significant in-roads as companies expand networks, specifically intranets and extranets, while trying to rein in the total cost of computing. So it comes as no surprise that another area of importance will be middleware.

"Rather than throwing away billions of dollars in IT investments, companies can now use Java-enabled middleware products, such as MQSeries, to link disparate applications and platforms to form smooth



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functioning wholes," says Harvey Lewi manager, software marketing, for IBM Canada Ltd (http://www.ibm.com) And systems management will be a key growth area as poorly managed systems hamper efficiency "Products such as Tivoli Systems' TME 10 provide a reliable framework for standardization and management," says Lewi

"The vision of the PalmPilot is to continue its emergence as a horizontal product with vertical applications."
— Nick Tidd

Once networks are running efficiently, look for electronic commerce and sales of related hardware and software, to explode IBM's Universal DB2, a multi-platform, multimedia relational database, will allow companies to link corporate information such as videos, sales forms, digital images, text and spreadsheets to the Web enabling companies to effectively conduct E-commerce.

Pushing Knowledge

With more people processing more information from more computing devices on more networks with more bandwidth than ever before, managing knowledge will become an issue, says David Weinberger (davidw@opentext.com), vice-president, strategic marketing of Waterloo, Ont.-based Open Text (www.opentext.com) Although as much a set of practices as a technology, "knowledge management is clearly set to emerge in 1998."

While intranets have been used to publish corporate information such as policies and procedures, intranets will emerge as the platform for collaborative work spurring sales of products such as Open Text Livelink, a collaborative knowledge management application used by 150 global companies in its first year of availability.

We can also expect to see push technology flourish, Weinberger and others predict. So make way for increased use of PointCast and of channels on Microsoft Internet Explorer, for example. "Last year was a tremendous year of growth for PointCast Canada," says Jennifer Stewart, marketing manager of Toronto-based PointCast Canada.

Going from almost zero to over 300 000 registered Canadian viewers, PointCast (http://www.pointcast.ca) helped establish the Internet broadcast market. Stewart expects news and information to become "a more targeted and highly personalized experience" due to products that combine push technology with intranets such as PointCast's Intranet Broadcast Tools and new channels on the PointCast Network, Connections and Industry Insiders which turn PointCast into an extranet tool.

Paper Here To Stay

Even with the continued growth of digital information, none of the experts dared to predict the arrival of the often heralded paperless office. In fact, 1997 was an extraordinary year in desktop printing for Xerox "and 1998 is going to be even better," says Chris Punnett (chris_punnett@torbo.xc.xerox.com), director of marketing, Xerox Canada Channels Group, North York, Ontario.

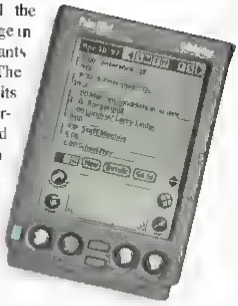
While convergence between printers and photocopiers will continue, 1998 should also be the year that "color laser printing will be affordable to almost anyone," says Punnett. In addition, low-cost, feature rich products such as the Xerox DocuPrint C55 will smooth the path to even more affordable color laser printing for corporate and small business markets.

And printing technology will not ignore the network. Punnett predicts better printer management software will allow network administrators to remotely install, configure and manage printers across multiple network environments using intranets and the World Wide Web.

Good Things; Small Packages

The future also includes more computer power in smaller packages. While there will be continued healthy growth in the notebook computer market, growth in the handheld computer market will be phenomenal.

Accounting for one of every two handheld computers in people's pockets around the world, 3Com's PalmPilot has led the charge in the growth of personal digital assistants (PDAs) and handheld computers. "The vision of the PalmPilot is to continue its emergence as a horizontal product with vertical applications," says Nick Tidd (ntidd@mhz.com), director, Canadian sales, 3Com Canada in Burlington, Ontario (http://www.3Com.com). He points out that more than 3 000 developers have created applications that broaden PalmPilot's utility base and says 1998 will see even greater developments for vertical markets.



So don't be surprised when you see surveyors, census takers, inventory managers, couriers and others replacing paper based operations with handheld devices that take advantage of wired or wireless synchronization to desktop and networks from the field or office.

Those who find notebook computers too big and handheld computing devices too small may find the Toshiba Libretto mini-notebook just the right fit as the trend towards portable computing devices that meet the needs of almost every business and consumer segment continues.

"Gigabit Ethernet, combined with routing switch technology, will dominate LAN backbone implementations through to 2000."
— Oliver Gnass

Other important portable computing trends include the advent of portable DVD notebooks, making mobile computing more practical than ever, says Robert Grossman (robert_grossman@mail.toshiba.ca), vice-president and general manager, Toshiba of Canada, Information Systems Group in Markham, Ont. He predicts notebooks will be more seriously considered as desktop replacements and points to the Toshiba Tecra 750DVD — a notebook computer that puts 17GB of mobile storage in the hands of users along with advanced multimedia and video capability — to demonstrate that his prediction is based in reality.

And finally, some things all industry pundits agree on: computer processing speeds and storage capacity will increase, prices will come down, margins will be squeezed.

So resellers, if you believe all, or any, of the above, then your mantra for 1998 should be "Specialize. Add value. Specialize. Add value. Specialize .." ■

Paul Luna is a Toronto-based journalist who specializes in high-technology reporting. He can be reached at tiko@idirect.com

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Reboot — remotely reset one, a group, or all student stations. Useful for system reconfiguration, or even stopping students from playing PC games during class.

Group — automatically or manually divide student stations into groups of up to four stations per group. LED on Control Panel identifies group members. Great for language training and group projects.

Group Dialog — after dividing student stations into groups, allows students in groups to communicate with each other. Teacher can listen and participate in any group at any time! Great feature for language training and group projects.

Student On/Off Line Indicator — LED at Control Panel indicates when a student logs on or off the HiClass System.

Save Seat Table — saves student seat position table to an ASCII file for the teacher to view and print.



Upgrading Your Niche

How con you find the right technology or business opportunity to poise your compony for success?

Since the start of the PC technology revolution, resellers have always had to keep on stay on top of the technology wave to survive It has always been a truism of the business that products come and go so fast that it is hard to keep up!

Yesterday's new solution is today's commodity sale. LAN installations, for instance, are now much easier to install than before The rule of thumb in this business is that the money is usually made on the services or customization offered, not the actual products

But as technologies of various sorts start to converge (computers, cameras, television, telephones, pagers etc.) the decision to pick out the winners and losers among the array of new hardware and software products and solutions becomes more of a challenge

Theoretically, resellers in general should be "well-positioned" to stay abreast of incremental changes in technology because "they tend to get forward-looking information from their suppliers," says Michael O'Neil, executive vice-president of the Toronto-based International Data Corp (Canada) Ltd "They are certainly recruited by the organizations that bring out radical changes in technology."

Find A Niche

For example, security is a big issue among corporate clients and Roger VanderBeek, the owner of the LAN Shoppe in Toronto admits he is "probably late in the game," compared to competitors who have been pushing solutions for about a year in this area. "We are considering a couple of different firewall products," says VanderBeek "We have evaluated several and are looking at a few other ones just to make sure that we are familiar with the technology Our guys get demos, evaluation copies, get their feet wet with it and find out where their strengths and weaknesses are And based on that, we can make informed recommendations to the client."

Spend The Money: Research And Train

VanderBeek says he is reluctant to spend money on the investigation of new technologies on-the- horizon unless it is absolutely necessary

Resellers are also constrained by their finances and therefore understandably wary, adds O'Neil, because they are the ones stuck with providing support and maintenance to the end user "Those bleeding technologies aren't as stable "You don't want to be a technological laggard if you are in the technology business But on the other hand, you don't want to bankrupt your company by attempting to support a product that is apparently not realizable and stable "

However, he says it is a blessing to find a new market niche which is not terribly crowded at the moment.

Bruce Stuart, president of the Vancouver-based Channel Corp Management is worried that two-thirds of resellers are "ill-prepared" for oncoming technology trends. He says they do not have anybody on staff dedicated to the marketing function. In Stuart's definition, that involves identifying the markets, communicating the appropriate messages to clients and "manufacturing" the prospects. "As technologies converge, the messages that resellers have to deliver to their potential clients change. If there is no facility to make that communication process happen, then it doesn't happen "

Invariably, resellers have to make choices on which technology to invest their investment dollars, says Stuart. "You've got to place a bet on Microsoft versus Novell, you've got to make a Netscape versus Microsoft bet, you have got to make a bet on HP versus Sun versus SGI "

"The amount of money somebody has to invest to become a half-decent Bay Networks VAR or Cisco VAR is not cheap What that means is that they have to have the ability to invest in technical capability and in a lot of cases new marketing and sales capability "

This involves having one's staff continuously retrained, something that resellers are not always wild about doing, adds Stuart, as it is viewed as an "extra" expense, especially if they are barely profitable and there is not enough slack in the budget to loosen up some cash

Stuart believes that the convergence in technologies will create new types of resellers such as Internet VARs who "were not a species two years ago."

While there is a dearth of high-end VARs in this country, he says, a shakeout is inevitable among the low value added PC retailers "There is probably more capacity in Canada than the market needs at this point "

Yet, it is also the large volume retailers with their thousands of SKUs which can afford to display new products and "give them a shot," says Don Millman, a product manager for the Vancouver-based Doppler Computer Superstores. His main concern is that the vendor keeps the channels informed when a model has been discontinued. "We want to be known as fairly cutting-edge."

Danger Ahead?

Resellers need to look ahead, both at the opportunities and the pitfalls. For example, one danger down the road is that resellers might be entirely locked out of the converged technologies by large players who pitch their products services directly, says Susan O'Dell, president of the Mississauga, Ont.-based Service Dimensions Inc. She adds, "Both the cable companies and the telephone companies are seriously exploring direct reselling relationships." CW

Paul Weinberg is a Toronto-based journalist specializing in high-technology reporting and business. He can be reached at pweinbg@interlog.com

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by Jeff Evans



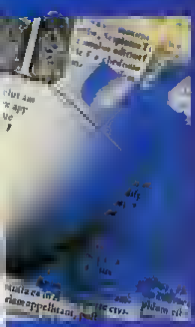
For the last 20 years, it has been pretty simple for the computer reseller to determine what input devices should be offered along with a PC.

The computer keyboard, which allows the user to type in commands and other data to a personal computer, has consistently been the principle input device for the standard office applications, including word processing, spreadsheet and database programs. Since the release of the Apple Macintosh at the end of 1984, the computer mouse, used in conjunction with operating systems and applications that offer a 'graphical user interface,' has been the second key component to making computer input easier and more intuitive for the mainstream computer user.

In 1998, it seems likely that the keyboard and the mouse will remain the two most important computer input technologies, but resellers should be aware that the keyboard, and more especially, the mouse, will change significantly, and will face competition for buyers' dollars from other, often rapidly developing input devices.

Person-Machine Interface

What drives the development of new PC input technologies is a never-ending pressure for more productivity, simplicity, and healthy operation of computers by their human users. The more widespread computer use becomes, the more this demand for better input devices will increase, and the more new products will be offered to resellers. The question is, which input technologies will find a receptive market, and offer sales and profit potential for resellers? Opportunities for resellers to 'upsell' customers to new input devices will only be realized if those new devices actually offer substantial end user advantages. Consider 'input' from point of view of the end-user controlling the operation of a PC. In most cases (but, as we'll see, not all cases) this excludes input devices that grab pictures or data, such as scanners, video digitizers, and audio digitizers.



The art, science and business of the person-machine interface is a key part of computing, and one that is too often taken for granted by PC end-users and resellers.

This lack of awareness of the importance of input technology has deep historical roots. Originally, the assumption was that using a computer was a highly technical specialist function. Engineers, systems analysts and programmers understood the languages of the computers they used, and they could actually visualize the operations of the programs running on their computers in their own minds. They interacted with the computer via switches, flashing lights, and punched tapes or punch cards. Today's average computer user often has little or no understanding of the inner workings of PC hardware and software, and basically wants input devices that are as simple to use as a typewriter, a VCR controller, or a CD player.

In the early 1990s, a flood of reports of Repetitive Strain Injury (RSI) associated with keyboard and mouse usage prompted an urgent search for new, better input technologies. This resulted in some new models of keyboards and mice on the market.

Ergonomic Keyboards

Microsoft released a significantly redesigned keyboard in 1994, featuring a boomerang-like, sloped keyboard layout, with a generous palm rest. This is supposed to allow users to work more comfortably, and cause less stress on tendons and muscles in the wrist, forearm and hands. Other companies have followed the Microsoft lead: Canadian distributor Comtronic offers an Acer ergonomic keyboard. Cost-conscious resellers and consumers may try to improve the comfort of an existing keyboard through a separate padded palm rest, and by a sliding keyboard tray which allows the keyboard to be mounted at a lower, more comfortable height on a computer table.

At Comdex/Fall, Microsoft launched the Microsoft Natural

Keyboard Elite, successor to the Microsoft Natural Keyboard. It offers a smaller footprint, and a USB-compatibility option.

One alternative form of keyboard, the Dvorak model, had a different arrangement of keys than the standard QWERTY keyboard layout, which was derived from the standard typewriter keyboard. Dvorak boosters claimed that the more intuitive layout of the Dvorak keyboard enabled up to 10 to 25 per cent faster keyboarding than QWERTY, but even if these claims had substance, end users were not convinced, and the QWERTY keyboard rules supreme.

Ergonomic Mice

The original Apple Mac mouse looked a lot like a bar of soap, with a single button to click for making selections. Manufacturers soon began to create mice that were better molded for the shape of the human hand, and which offered two, three, or more buttons for more flexible use.

Microsoft introduced a gently curved mouse which is the most popular in the North American market, and other innovative mouse-makers such as Logitech and Genius have introduced a wide array of variously shaped mice, mice with trackball capability, wireless mice (mice lacking a 'tail,' or cord, which communicate with the PC via infrared or radio frequency transmissions), multicolored mice, and so on. The biggest innovation in mice for 1998 are the 'scrolling and zooming' mice, which take advantage of features in the Windows 95 and Windows NT operating systems to speed up scrolling and zooming, by using a scrolling wheel (commonly located between the two buttons of the Window mouse), and a zooming button (commonly located on the side of the mouse where it can be operated by the user's thumb). The market's response to these latest mice is yet to be seen. They are especially useful for navigating large Web pages, graphics screens and spreadsheets, but they also cost anywhere from $15 to $70 more than a regular economy model of mouse, and may not be attractive to price-conscious and first-time PC buyers.

At Comdex, Microsoft anounced the IntelliMouse TrackBall — a trackball to incorporate the IntelliMouse navigation wheel.

Touch Screens

The traditional touch screen is a pressure-sensitive film that is applied to a monitor screen, and which usually connects to the PC via a serial cable. Touch screens are widely used for interactive information kiosks such as are often found at trade shows, or in some banks, schools and training departments. The advantage of a touch screen is that it allows a user to input selections to the computer by touching an icon on the monitor screen, avoiding much of the training burden of using a regular computer operating system. The downside of touch screens includes high hardware cost (usually several hundred dollars for custom installation), maintenance and support (touch screens can be damaged, or their cables become disconnected), and the need for specialized applications software. Also, some users have trouble operating touch screens (pressing with the fleshy ball of the fingertip may not result in effective input, depending of the sensitivity of the screen surface-users may need to press with a fingernail tip).

Pen Computing, Handwriting Recognition, And Handheld Computing:

The traditional touchscreen may have retreated to a small specialist market, but touch input has experienced a huge resurgence due to the introduction of hand held computers with touch sensitive LCD screens, such as the Apple MessagePad and eMate 3000, the 3Com PalmPilot, and the Windows CE handheld PCs. With these devices, input can be done either from a very tiny keyboard, or directly into the screen with a special stylus. Most of the handhelds offer handwriting



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Hardware Focus: Network Computers/Net PCs
Software Focus: Games
Lab: CD Recorders

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recognition, so the user can write on the screen in a manner similar to drawing on an old Etch-A-Sketch, and the handheld computer's software will (theoretically) convert the user's handwriting into computer text.

Tablets

One of the most natural ways people recorded information in the days before computers was by drawing or writing with a pen. A keyboard is a very poor drawing tool (Some of us remember 'drawing' with cursor keys and keyboard macros on a Canadian Telidon system around 1978), and even a mouse is much clumsier than a pen or pencil. The desire to allow for intuitive pen input into computers has spawned a great many tablet-style peripherals. Some tablets are huge (up to 20 by 20 inches, and cost thousands of dollars), while others are tiny (as little as four by five inches, at less than $100). The main applications are in graphic arts, computer-aided design, 2D and 3D animation, architecture, and various other industrial, scientific and design specialties.

Wacom is the undisputed leader in graphic arts tablets. Wacom has recently developed a model of a tablet where the tablet surface is actually a full color LCD display. Drawing on this tablet with the help of a program such as Fractal Painter is uncannily like drawing and painting on a canvas with traditional artistic media.

The Perils Of The Pen

Bill Gates, who is rarely wrong, was for many years a great booster of pen computing, believing that the advantages of handwriting recognition (users don't have to learn to type, PCs could do without keyboards, handheld PCs would become more usable) meant that it was inevitable that pen input would become a huge market. But here, Bill was wrong, at least for now.

For easy text input, a full-sized keyboard is far more productive and comfortable than pen input. Handheld devices such as the PalmPilot are intended for very minimal text input, and the 'words-per minute' text input speed on a PalmPilot is a small fraction of what it is via a proper keyboard.

Fujitsu has carved out a lucrative niche for itself with its handheld Stylistic PCs, but the Stylistics also are intended for mobile applications where text input is modest in volume. Most applications designed to run on a Stylistic handheld computer are designed to be controlled by pressing icons, rather than entering text. And, of course, the Stylistic has a keyboard port if 'real' text input is required.

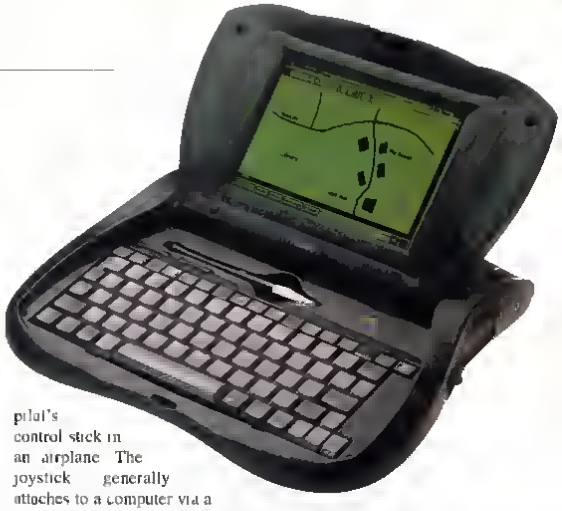
Wacom Technology Corp.'s UltraPen is the industry standard for professional drawing, painting and image editing on a computer and are used by more than 500,000 professional artists and illustrators worldwide to paint and draw with the same natural freedom and creativity as they are used to doing with traditional paintbrushes, pens and pencils.



Wacom has released the PenPartner UltraPen and Tablet, offering computer drawing, photo editing and pointing for less than $100. The cordless product provides 256 levels of pressure — so the harder the user presses the pen on the tablet, the thicker or darker the effect becomes.

Joysticks and Gamepads

Some interactive computer software, especially games where computer generated characters travel around a digital 'landscape' — exploring, fighting, jumping, driving, and even flying, require a more dynamic, quicker reaction form of input than a mouse or a keyboard can offer. One of the most common input devices for interactive gaming is the joystick, which is named after and derived from the pilot's control stick in an airplane. The joystick generally attaches to a computer via a serial cable, and most joysticks come with their own driver software, and an array of buttons to allow the user to activate game features such as shooting, jumping, and touching. Moving the handle of the joystick allows the user to move the character or look around. The latest joysticks all feature ergonomic design, with the handle of the joystick molded to a human hand's form, and various kinds of 'force feedback' to give a more realistic user experience. For example, a force feedback joystick may 'fight' the user's attempt to bank a simulated aircraft or maneuver a car at high speeds, and may vibrate when the user is 'firing' a weapon. Game pads are control devices also usually intended



The People Who Invented The Usable PC

Xerox Inc. is the originator of the usable PC. That company operates a research facility in the San Francisco region called the Palo Alto Research Center, or PARC. In the late 1970s and early 1980's some very creative people at PARC invented or refined all the essential components of the modern person-machine interface: windowing operating system, pull-down menus, icons, and pointing devices to supplement the keyboard. Xerox's senior executives had not the faintest idea of the potential market for the company's input and display technology: they figured putting it into a $100,000 word processing system for the girls in the typing pool might be worth trying.

They didn't even patent many of their input technologies. It may have been out of utter frustration that PARC employees welcomed other computer industry players to visit their lab and see what they had invented.

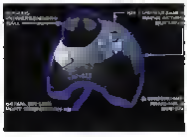
Steven Jobs of Apple Computer was one of the visitors, and as soon as he saw Xerox's revolutionary concepts, he hired various Xerox people, and quickly developed the (unsuccessful) Lisa PC, followed by the famous Apple Macintosh. Ease-of-use was a critical part of Jobs' vision of humane computing. In order for computing to be for everyone, it had to be as easy and pleasant as possible. The Mac showed the way for the computer to be a truly universal product, and helped spawn the exponential growth in computer use that continues to this day.

Bill Gates copied many of the ideas Jobs had borrowed from Xerox, and as Windows took off in popularity, the mouse became a normal peripheral on the Windows PC.

For those with a special interest in Computer Human Interface developments, a special interest group of the Association for Computing Machinery (ACM) maintains a good Web site (http://www.acm.org/sigchi/) on the latest issues in improved input technology.

Today one of the most productive centres for the development of new computer input devices is the University of Toronto's Human Computer Interaction Group. One of whose directors is Bill Buxton, a world expert on input technologies (http://www.dgp.toronto.edu/HCI/hcip.html).

for interactive games, where the user grips the device with both hands, and manipulates buttons to control movement around the game, and to initiate specific actions



Voice Recognition

In 1997, improvements in voice recognition software and in the processing power of computers combined to bring true, natural voice-to-text dictation to the PC IBM's Via Voice software allows users of a suitable Windows PC (with at least a Pentium 166MHz processor and 24MB or more of RAM) to dictate text into Microsoft Word or Lotus Smart Suite or control the Windows user interface by voice Apple which was the leader in voice recognition technology for awhile in the early 1990s, has fallen behind in this field

IBM also offers some of its less fully featured voice recognition software, such as Simply Speaking Gold, for use on less powerful PC configurations. IBM's various voice input software titles sell for between $50 and $140, depending on features Lotus is offering a version of Via Voice bundled with its Smart Suite business software suite High powered new natural speech recognition software is also offered by Dragon and Kurtzweil, two of the other traditional leaders in the voice recognition field

Resellers should be aware that in addition to selling voice recognition software there are opportunities to also sell the accessories and peripherals that enhance voice input These range from more RAM chips, to increased speed and custom vocabulary usage, to better quality microphones, headsets, audio cards and speakers

Trackballs, TrackPoints and Touchpads

Although the mouse is the undisputed champ of pointing devices, people keep trying to replace it with a variety of alternatives, some of which have noticeable advantages. The notebook computer has been the test-bed for a lot of would be mouse replacements Very often, a mobile computer user has to work on the go, and carrying and attaching a mouse every time he or she stops for a moment to write a note is not convenient

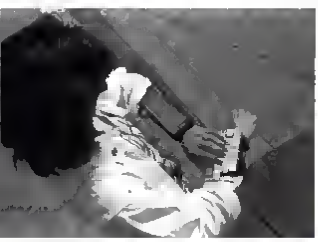
Because of this, all notebooks have a built in pointing device The TrackPoint style cursor controller looks like the end of a pencil eraser, stuck between some keys in the centre of the notebook's keyboard IBM is the originator of the TrackPoint, but the concept has been widely copied Resellers should beware of any non-IBM trackpoint-like devices, as they may be less durable, and may have much less useful driver software than the name brand version (Toshiba offers excellent TrackPoint 'clones') Good TrackPoint software has been carefully designed to suit normal human finger movement and motion perception, based on hundreds of hours of careful observation of typical users. Poorly written trackpoint software results in a trackpoint that is hard to control, often speeding up cursor movement too quickly and overshooting the point on the screen that the user was aiming for

Trackballs were a common competitor to the mouse in the early days of windowing operating systems, but have been pretty much



superseded by other devices, except in some specialty gaming and other applications.

Touch pads alternatives on notebooks are commonly about one-and-a-half inches by two inches in size, and are located on the palm rest at the front of the computer keyboard, where the user can control the cursor's location by lightly moving a thumb around on the touch-pad surface. The major disadvantage of the touch-pad, is that it's too easy for the user, especially if tired, to let their thumb droop down and accidentally touch the pad surface, causing the cursor to jump away to some unintended location on the screen. Cirque is one of the main



innovators of touch-pads. Standalone touch-pads that connect via a serial cable, and keyboards for desktop computers with touch-pads built into the keyboard, are available, but they have not attracted a large number of customers.

Automated Data Entry Devices

For the commercial, governmental, medical and industrial markets, there are many input devices such as barcode readers and laser scanners that can be used to capture information for quick input into computer databases or other applications software. Many of these are portable or even 'wearable' devices.

Wireless and Infrared Input

Wireless input allows the possibility of 'roaming' use, where the user can be inputting text or mouse commands from any point in a room, a presentation theatre, or even a large building. Wearable keyboards are available, and one particularly interesting wireless device is a Philips wireless trackball and microphone, which allows the user to control a cursor and input speech, either for voicemail recording or speech recognition, from a considerable distance from their PC.

Logitech has announced an exciting new 'wireless desktop,' featuring a wireless keyboard and mouse. With the combination of users wanting to surf the Web from their couch, using a large format TV as a display, plus the simpler device installation of Windows 95's Plug and Play, wireless input devices may experience a renaissance in 1998.

Children's Input Devices

Because very small children commonly are still developing the fine motor control and literacy skills necessary to use a keyboard and mouse effectively, they may benefit from specialized children's keyboards and software. One example is My First Keyboard from RF Link, a colorful, simple to use, "peanut-butter proof" keyboard for children ranging in age from 1 1/2 to 5 years.

Special Needs

A certain portion of the population is prevented from using regular computer input devices due to some form of disability, such as blindness, or restricted or no use of hands or arms. A wide range of specialty input devices include special keyboards, to voice recognition, breath activated or eyeball tracking, or blink sensing devices. Sightless keyboarding is made possible by software that speaks the typist's words, and allows them to detect and correct errors. The market for these kinds of input devices is more a labor of love and social obligation than a quest for profit. Nevertheless, much useful knowledge has come out of this sector of 'social computing.' It's worth remembering that the invention of the telephone was largely driven by Alexander Graham Bell's long involvement in learning and serving the needs of the hearing-impaired. CCW

Jeff Evans is Associate Editor for Canadian Computer Wholesaler. He can be reached at jeff@tcpon.com

The Weird And The Wonderful Side Of Input Devices

There's no lack of imagination in the input device game. Nearly every imaginable way for a human user to interact with a computer is being tried. Here are some of the more interesting ones.

Virtual Reality-Head Tracking, Data Gloves And Body Suits: A few years ago, Virtual Reality was all the rage. A technology that used head mounted video displays to give the user the impression of being in a realistic interactive computer environment. The user changed the visual display by moving their head: motion-tracking equipment in the headset instructed the computer to re-draw the scenery to match the changing view of someone moving about in a real space. Data gloves and body suits were developed to allow the user to seem to run, fly, swim, drive, and use imaginary tools: musical instruments and weapons in the 'virtual world.' The drawbacks were ferociously high cost, complexity, and lack of compelling software applications. Virtual reality input technology has made it to the consumer entertainment level, in the form of simplified data gloves and head mounted displays, but VR has still failed to take off as a mass market.

However, input technology for training simulations is part of a multi billion dollar global industry, where PCs are becoming increasingly common as Windows NT and high-powered Intel and DEC Alpha based workstations bring costs down to much more affordable levels.

Biometrics: This is a field of person machine interface where computer devices allow the user to employ biological data to gain access into a secure computer environment. For example, the BioMouse from American Biometrics allows a user to place his or her finger onto a sensor, in order to gain entry to a computer system or a computer controlled facility. Other biometric systems using voiceprint, or retinal scan, or face recognition technology also exist. Aside from the BioMouse, all the other existing biometric technologies are too unreliable, expensive and difficult to maintain to find much of a market outside of sci-fi and espionage movie thrillers.

Vivid's Mandala, And Gesture Input: One of Canada's notable success stories in the field of innovative input technology is the Mandala, an 'immersive' form of virtual reality, where a live user's video image is inserted into a computer generated environment. Users can play games, operate musical instruments, lighting systems or other devices, or appear in 'virtual meetings' with other Mandala users anywhere on the planet. Vivid has sold hundreds of Mandala systems around the world, to users ranging from Japanese theme parks, to museums, to the Smithsonian Institute, to TV shows. The Mandala was inspired by its inventors' interest in creating a gesture input device that would enable disabled people to interact with computers with both practical and therapeutic applications.

Brainwave Control: An American university researcher has developed a simple but effective flight simulator chair controlled by brainwaves. Using bio-feedback, a user can learn to generate specific brainwave patterns that can be sensed by the simulator and interpreted as commands to maneuver, or change speed.

Computer input of words or pictures from brain scanning is, fortunately, still in the realm of fantasy.

Eyeball Tracking: Some computerized military weapons systems, and psychological measurement systems, can track the directions that a user is looking. In military systems, this allows a pilot to aim by looking at the target. The computer then locks on to the target, and the pilot can issue the command to fire, and look elsewhere while the computer directs the weapon to the target. In psychological measurement systems, a test subject is shown a picture (say of an advertisement, or a movie star), and the eye tracking system records where the eye is focused, and for how long. This gives very useful information about what a viewer is actually attracted to, and interested in (men tend to stare at a pretty woman in a picture, and then verbally claim that they were reading the advertising slogan).

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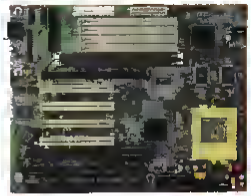
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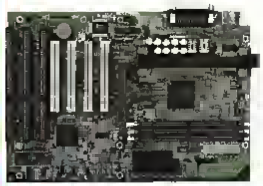
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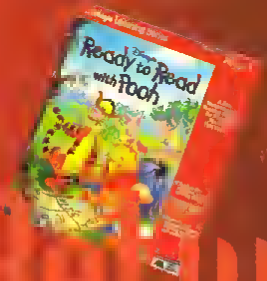
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New Multimedia Blurs The Boundaries Between Learning and Playing





by Alan Thwaits



Remember when you were a kid, and learning meant plowing through the pages of a bookshelf-long row of encyclopedias? And fun meant getting outside to bicycle, play ball, or build forts? Remember the wrench of moving from one to the other?

Well, that was then — this is now. What's changed — besides the almost certain addition of a few grey hairs and a number of extra pounds — is that the distance between fun and learning has become minimized. In fact, in many instances, it's hard to distinguish the two.

Welcome to the world of edutainment. It's a clumsy term (a common alternate, infotainment, isn't any better) but it points directly at one of the category's greatest strengths — that fun and learning can be had at the same time. Best of all, that goes for adults as well as kids.

Though advances in computer hardware often get the media's attention, it's what those advances let the end-user do that drive markets. Faster processor speeds, larger memory capacities, and the availability of alternate media are only some of the technological boosts that fuel increased PC usage. And, people being what they are, that means that the good stuff on software isn't all in the realm of business databases and graphic word processors, but also in the realms of fun and learning.

Multimedia encyclopedias offer an excellent example. Gone are the days of pages of densely-packed text and the occasional color photograph (both probably a couple of years out of date, given the realities of print-based publishing).

The Brave New World of Encyclopedias is typified by such offerings as Microsoft's Encarta 98, which brings the user up-to-the-minute content — and then some. The Deluxe Edition of Encarta 98 (which is available on store



shelves now, and retails for $109), includes more than 32,000 articles, plus more than 16,000 media elements (photos, sound and video clips, maps and charts). Those advances in computing technology we mentioned earlier are used to offer, among other features, 360° virtual tours, which give the user panoramic views of places like Istanbul's Blue Mosque.

The modern world lives by interconnectivity, and Encarta answers the need: 10,000 built-in Web links allow Encarta users to move from the CD-ROM based encyclopedia to online exploring and back again with only a click of the ever-familiar mouse button.

For all the contemporary bells and whistles, multimedia doesn't mean leaving the tools of the past behind. Encarta 98 presents background to articles as Sidebars, so that users can examine primary documents, letters written by people cited in the article text, and first-hand accounts of historical events. Content, navigation, and eye-pleasing graphics are the name of the game.

An offering that will appeal to many Canadian buyers is McLellan and Stewart's Canadian Encyclopedia 98. It offers all the bells and whistles of a quality multimedia encyclopedia, but with content created especially for Canadian users. The level of articles is appropriate for all users, from grade school essayists to adults searching for background about the Canadian arts scene. Better still, Canadian Encyclopedia has been a best-seller in recent years, and early sales of the 98 edition suggest that the pattern will be repeated.

While encyclopedias will always have a ready market, it's sales of multimedia games that have gone through the roof. One reason is that, with more computing power and enhanced hardware, computer-based gaming just gets more awesome — graphics, sounds, and connectivity can mean more than life itself to a dedicated gamer. Another is that gaming is no longer the preserve of the teenage male. "What's most surprising," says Bruce MacDonald, product manager of entertainment for Beamscope Canada Inc., a major Canadian distributor of multimedia products, "is that the market isn't about kids' games anymore. We're looking at a huge installed base of users who have grown up with games, and who have established a worldwide gaming community. We're seeing the emerging 'collectability' of game software, as well, as an Internet-based community where the latest game news, patches, and levels are discussed."

Some multimedia games are at the interactive leading edge, where players of games like Quake and Battle Tech often play opponents on-line via the Internet. To appeal to those whose blood runs a little more slowly, toy maker Hasbro is marketing multimedia versions of traditional board games such as Scrabble, Yahtzee and Clue.

Where multimedia shines, though — and where the fun and the learning come together like the contents of a kid's lunchbox — are in products marketed for younger children. Some of these are produced by the big names in children's entertainment, such as Disney's new Winnie the Pooh Learning Series and Aladdin Math (featuring the voice of Robin Williams), both of which build on the success of its recent cartoon offerings, and Mattell, which has four new titles in its Barbie series of software. Knowledge Adventure continues to succeed with the Jump Start series, which has multimedia packages for children from kindergarten through toddler and preschool stages to the Grade 5 level. And a new company called Purple Moon focuses on girls aged 8-12, responding to complaints from parents that computer software for this group was lacking.

Technology pushes the envelope for both Mattell and Microsoft offerings — both Mattell's Talk to Me Barbie and Microsoft's Barney Actimates product lines combines the traditional "doll" with computer software, voice recognition tools, and PC connectivity. In Barbie's case, an infrared chip in the doll's necklace allows a measure of interactivity between the doll and the user, which the user being able to ask questions and the doll to respond. Barney, according to Natalie Tehrani, marketing manager, Interactive Media group, Microsoft Canada, interacts with the user as a standalone product, via a VCR/TV connection, or via a Windows-equipped PC. "All the possible interaction with Barney has been based on extensive research by experts in early childhood education," says Tehrani, "so that the child gets reinforcement for activities like shape recognition, counting, and reading. And the benefits built-in to the Barney Actimates line build on the technology's abilities — the 2,000 word vocabulary in the standalone Barney grows to 4,000 words with the VCR/TV plug-in, and to 14,000 words with the PC plug-in."



For those who just can't get enough — and who want to combine fun, learning, and a caring environment — the way to go is probably a new product by Bandai Digital Entertainment, the folks who gave the world the Tamagotchi "virtual pet." If having a Tamagotchi on your key-chain wasn't enough, you can now have one on your desktop system. A new Tamagotchi for the PC, based on CD-ROM technology and available in Canada in November, can be yours for only $23.99. A major advance on its key-chain cousin is that the Tamagotchi that lives in your PC will have a "virtual care centre" you can choose to send it to when you have to shut down your system to the real world.

Now, who ever said computers weren't fun? CW

Alan Thwaits is a Toronto-based journalist. He can be reached at nomad@praxcomm.com.



Home For The Holidays

Know your market: It's budget-conscious, but technology-hungry!



Next to the TV set (or maybe in place of it, if you value learning, fun and productivity over passive viewing), a PC is today's all-around family entertainment centre. Parents can work at home and handle family finances; kids can get homework done; and everybody can roam the Internet and enjoy great games.

The trick for the consumers is getting the most PC for the dollar. Multimedia titles demand even more horsepower from computers than do today's heavyweight office suites, and most homes don't have an MIS budget; parents have to pay for piano lessons, and growing children need new clothes. Fortunately, many mail-order vendors offer good deals on bundles that include stacks of family-oriented software. These are some of the best bargains in the direct channel.

The Demands Of Home

Following lacklustre '96 holiday sales, manufacturers and vendors are eager for the multimedia capabilities embodied in the next-generation Pentium to snap consumers out of their upgrade doldrums. Much has rested on the success of Intel's new MMX-enabled chip. The excitement comes from the new chip's multimedia extensions (MMX). These additional capabilities speed up graphics, sound, animation and 3D rendering — all the things that make computers really cool. The new chip has forced changes in the industry. Software is being rewritten to take advantage of the new technology. While users will see some reasonably good acceleration of programs without new software, the killer benefits will come when code is optimized for MMX.

In plenty of time to snag the attention of even the earliest holiday shoppers, three personal computer giants recently took the wraps off their latest lines of consumer PCs.

Hewlett-Packard Co., IBM Corp. and Compaq Computer Corp., which sell millions of personal computers to the business sector each year, have descended on the home computing market with an impressive array of products designed to establish new standards in power, speed and multimedia capabilities.

Sales Extravaganza!

Fueled by the popularity of graphics and video enriched CD-ROMs and the lure of cyberspace, the consumer PC market has more than tripled over the past year. According to a survey conducted by Dataquest, a San Jose, Calif.-based research firm, worldwide sales of multimedia PCs exceeded 10 million units in 1994, up from 2.5 million in 1993. Industry insiders and analysts are projecting even higher sales in the future.

Steve Harmon, senior analyst at Media-Net Analytics, a Pebble Beach, Calif., research firm, estimates that 22 million U.S. households will have multimedia personal computers by the end of 1996. That figure represents about 23 per cent of homes in the U.S., says Harmon.

Computer giants are looking to increase the size of their respective slices of the home computing market, which has been dominated by Apple Computer Inc. and Packard Bell for the past few years. For consumers, the efforts of HP, IBM and Compaq mean that their money will go further this year than it ever has in the past. Holiday shoppers will be able to choose from a staggering number of personal computers that will offer unprecedented performance for roughly the same price as last year's models.

Consumers won't be the only group to prosper from this new wave of multimedia systems. By seeding the home market with state-of-the-art hardware, other segments of the computer industry should benefit as well. The powerful new components that characterize all three product lines should open up new opportunities for multimedia software developers and service providers.

In conclusion, vendors should really focus on marketing multimedia systems that incorporate MMX and fits the average holiday budget.

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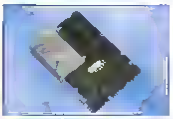
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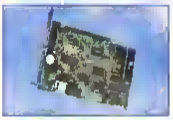
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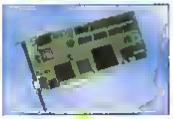
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Darius



Suggested Retail Price $2,030

Street Price $2,000

Reseller Price $1,720

Reseller Authorization Yes

Volume Discounts.
Discounts are available to resellers who deal with educational institutions or corporate employee purchase plans

Demo Unit Availability And Restrictions.
Limited to one demo unit per reseller at five per cent off regular reseller cost.

E-mail darius@istar.ca

Editors' Notes
Using the latest 430TX chipset and 512KB of pipelined Level 2 cache and 32MB of SDRAM, this 200 MHz MMX system offers good overall performance while maintaining a fairly modest price tag. It includes a 3.5GB hard drive from Fujitsu, an S3 ViRGE video card with 2MB of EDO RAM onboard, a Panasonic 24X CD-ROM drive, a Creative Labs Sound Blaster AWE64, and a 33.6Kbps modem from U.S. Robotics with voice and speakerphone

STD CompuPartner



Street Price $1,699

Service Depots
Atlantic — Dartmouth, N.S.
Quebec — Montreal
Ontario — Toronto, London, Ottawa.
Manitoba — Winnipeg
Saskatchewan — Regina
Alberta — Edmonton, Calgary
B.C. — Vancouver

Volume Discounts Yes

Editors' Notes
The machine has a Intel 233 MMX processor, 512KB of pipelined cache on a QDI motherboard, 32MB of EDO RAM, and a Matrox Mystique video card with 4MB of SGRAM onboard, which helped this system achieve the second fastest overall score, as well as in the desktop graphics portion of the benchmarks. It has a OPTI 931M-3DS sound card and a Panasonic 24X CD-ROM drive.

Elco V8

Reseller Price $1,688

Editor's Notes
This was the only system which used a chipset other than the popular Intel 430TX found in nearly all other systems. This particular machine used the VIA VP3 chipset on an Epox motherboard. The CPU was a 233 MMX processor, and was backed by 64MB of SDRAM. Storage comes in the form of a 2.6GB Fujitsu hard drive.

The video subsystem in this machine consists of an ATI Xpert@Play card with 4MB of SGRAM onboard. Multimedia components include a 24X CD-ROM drive from NEC, and Creative Labs Sound Blaster 16 sound card.

Compaq Presario 4528



Suggested Retail Price $2,492

Volume Discounts. No

Editors' Notes.
The Presario 4528 is not only easy on the eyes, but offers some innovative features. To start, the CD-ROM drive does not have a tray which holds the CDs. Instead, the user inserts the CD about one or two centimetres into the drive slot, at which point the drive senses the CD and pulls it in the rest of the way. This machine is powered by a 233MHz MMX processor, 256KB of pipelined cache, 32MB of SDRAM, a 3.2GB hard drive, 24X CD-ROM drive, an S3 video card with 1MB onboard, a 56Kbps voice/fax modem and a JBL 3D Virtual Theater sound system. The overall performance wasn't what it should have been, due mostly in part to the video card.

Daiwa

Street Price. $1,949

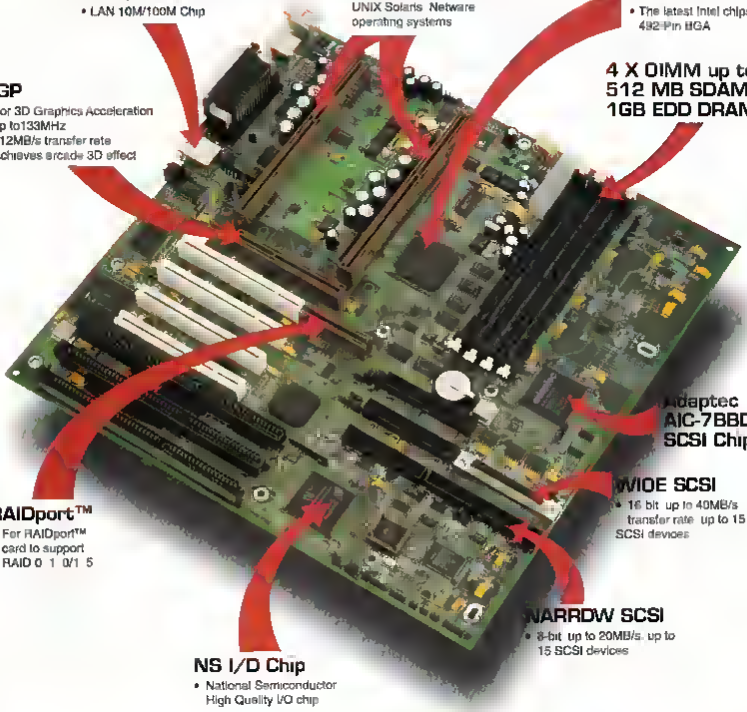
Reseller Price $1,835

Volume Discounts Yes

Editors' Notes.
Powered by the latest Intel Pentium 233MHz MMX processor, 512KB of pipelined cache and 32MB of SDRAM, this machine managed to achieve a decent overall score on our benchmarks. It includes the new ATI Xpert@Play with 4MB of SGRAM (with a games bundle) to the Panasonic LS-120 drive. Multimedia accessories include a 24X CD-ROM also from Panasonic, a Sound Blaster AWE64 sound card and a pair of multimedia speakers. Storage needs are met with a Quantum Fireball 3.2GB drive with Ultra DMA support for maximum performance.

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IBM Aptive E25



Suggested Retail Price $2,699 (with 15-inch monitor)

Volume Discounts No

Demo Unit Availability And Restrictions Units are available in limited quantities

Editors' Notes
The machine offers an excellent balance of hardware, software and very competitive pricing on a first-tier machine. This unit consists of a 200MHz MMX processor, 256KB of pipelined cache, and 32MB of SDRAM. A 3.2GB hard drive is also found in the system along with an ATI 3D Rage II+ video card with 2MB of SGRAM onboard. A 16-bit 3D sound system will enhance the multimedia experience, and the 24X CD-ROM drive keeps video and audio clips flowing smoothly. A 56Kbps Kflex modem is also included as part of this package to get your customer on-line right away. On the software side of things are Lotus SmartSuite 97, Netscape Navigator, PC Doctor, Crystal AudioStation and IBM's AntiVirus.

ALC Micro

Suggested Retail Price $2,150

Street Price $2,050

Reseller Price $1,850

Reseller Authorization Contact ALC Micro for details

Service Depots
Atlantic — Halifax
Quebec — Montreal
Ontario — Toronto
B.C. — Vancouver

Volume Discounts Yes

Demo Unit Availability And Restrictions Demo units are available; contact ALC for details

E-mail admin@alcmicro.com

Editor's Notes
New to our Lab Test for the month of December is this system from ALC Micro, built with Acer components. Powered by a Pentium 233 MMX processor and 32MB of SDRAM, this system wasted no time in making its mark. With the help of an ATI Xpert@Play video card with 4MB onboard and a Quantum Fireball 3.2GB hard drive with Ultra-DMA support, this machine managed to achieve a very impressive score of 224 on our benchmarks. Also found in this machine are a 24X Panasonic CD-ROM drive, an A-Open 56Kbps voice/fax modem, a 16-bit AcerOpen AW35Pro sound card, a desktop microphone and a pair of NEC multimedia speakers.

Mynix Mycomp



Suggested Retail Price $1,985

Street Price $1,865

Reseller Price $1,685

Reseller Authorization Resellers must have a sales office or retail store and at least one technician on duty

Volume Discounts Yes

Demo Unit Availability And Restrictions Demo for large dealers only

E-mail Klee@mynix.com

Editors' Notes
From Mynix Technology comes this Mycomp system. Falling into the 200MHz MMX class of machines this system achieved some good numbers on the benchmarks, although it encountered some problems with the database portion of the tests. Other than that, all numbers indicate this machine offers good performance thanks to the components found inside the case. Those components include 32MB of SDRAM, a Quantum ST 3.2GB Ultra DMA hard drive, a Matrox Millennium II video card with 4MB of WRAM, a BTC 24X CD-ROM drive, a USR Sportster 33.6Kbps fax modem and a BTC 1853L sound card.

Ultinet



Dec 97

Suggested Retail Price $2,305

Street Price $2,095

Reseller Price $1,990

Reseller Authorization Yes

Volume Discounts Yes

Demo Unit Availability Yes, for large orders

E-mail For Channel Use var-sales@ult.net

Editors' Notes
The fastest system this month was this Ultinet machine — equipped with an excellent mix of components. Powered by an Intel 233 MMX processor, 512KB cache and 64MB of high-speed SDRAM, this machine managed to achieve an overall score of 231 on our benchmarks. With components like the Matrox Millennium II video card with 4MB of WRAM, a Quantum Fireball ST 4.3GB drive, this system was already well on its way to achieving first place. To add the finishing touches to this system, we have a Sound Blaster AWE64 sound card, a Panasonic 24X CD-ROM drive and a U.S. Robotics Sportster 56Kbps fax modem. If your customers want the fastest Pentium system we ever tested, this is the machine to sell them.



MOUSE



TRACKBALL



NET MOUSE



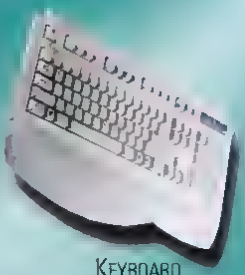
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Home Computers

Dec. 97

	ALC Micro	Compaq Presario 4528	Compucon	Comtronic Premium System	STD CompuPartner	Darius
Processor	Pentium 233 MMX	Pentium 233 MMX	AMD K6 233	Pentium 233 MMX	Pentium 233 MMX	Pentium 200 MMX
Cache	512KB pipeline	256KB pipeline	512KB pipeline	512KB pipeline	512KB pipeline	512KB pipeline
Chipset	430TX	430TX	430TX	430VX	430TX	430TX
RAM	32MB SDRAM	32MB SDRAM	32MB SDRAM	32MB EDO	32MB SDRAM	32MB SDRAM
Video Card	ATI Xpert@Play	S3	LeadTek L2300	ATI 3DXpression+PC2TV	Matrox Mystique	S3 ViRGE
Video Memory	4MB SGRAM	1MB EDO	8MB SGRAM	4MB SGRAM	4MB SGRAM	2MB EDO
Monitor	None	None	None	None	None	None
Sound Card	AcerOpen AW35Pro	JBL 3D 16-bit	SB AWE64	Acer FX-3D	OPTI 3D 16-bit	SB AWE64
Hard Drive	Quantum Fireball ST 3.2GB UDMA	3.2GB EIDE	Quantum Fireball ST 2.1GB UDMA	Western Digital 2.1GB EIDE	Quantum Fireball ST 3.2GB UDMA	Fujitsu 3.5GB UDMA
CD-ROM Drive	Panasonic 24X	24X	Creative 24X	Acer 24X	Panasonic 24X	Panasonic 24X
Modem	A-Open 56Kbps	56Kbps	56Kbps	A-Open 56Kbps	Linkskey 56Kbps	USR 33.6Kbps
System BIOS	Award	Compaq	Award	Award	Award	Award
Operating System	Windows 95	Windows 95	Windows 95	Windows 95	Windows 95	Windows 95
Extras	NEC speakers Microphone		Rock Excel speakers LS-120 drive	Videoconferencing unit Multimedia speakers LS-120 drive	Multimedia speakers	Multimedia speakers
Windows Benchmarks						
Desktop Publishing	200	144	200	181	197	186
Desktop Graphics	354	279	395	343	377	319
Desktop Presentation	228	176	230	215	237	202
Word Processing	206	154	208	192	207	186
Spreadsheet	239	186	220	227	235	212
Database	198	139	193	187	202	185
Sysmark 32	224	169	221	211	227	202
Contact	1-800-461-8079	1-800-567-1616	(604) 279-9696	(905) 881-3606	1-800-463-6763	(403) 640-0002
Internet Contact	www.alcmicro.com	www.compaq.ca	www.compucon.com	www.comtronic.ca	www.std.net	
Suggested Retail Price	$2,150	$2,492		$2,498		$2,030
Street Price	$2,050		$2,495	$2,120	$1,899	$2,000
Reseller Price	$1,850			$2,005		$1,720
Warranty (# of years labor, parts)	2L, 2P	1L, 1P	2L, 2P	2L, 2P	3L, 3P	3L, 3P

Dec 97

Performance
Ultinet
The numbers tell the story.
If you're looking for excellent performance, a very competitive price and the latest in computer technology, this machine has it all.

Price/Performance
CompuPartner
The CompuPartner system from STD is a clear choice when it comes to getting the best value for your dollar. Besides being an incredible bargain at $1,699, this machine took second place on the benchmarks.

LAB TEST

Daiwa	ELCD V8	IBM Aptiva E25	Mynix Mycomp	NEC Ready 9753	Packard Bell Multimedia S615	Ultinet
		Dec. 97				Dec. 97
Pentium 233 MMX	Pentium 233 MMX	Pentium 200 MMX	Pentium 200 MMX	Pentium 233 MMX	Pentium 233 MMX	Pentium 233 MMX
512KB pipeline	512KB pipeline	256KB pipeline	512KB pipeline	256KB pipeline	256KB pipeline	512KB pipeline
430TX	VIA VP3	430TX	430TX	430TX	430TX	430TX
32MB SDRAM	64MB SDRAM	32MB SDRAM	32MB SDRAM	32MB SDRAM	32MB SDRAM	64MB SDRAM
ATi Xpert@Play	ATi Xpert@Play	ATi 3D Rage II+	Matrox Millennium II	ATi 3D Rage II+	ATi 3D Rage II+	Matrox Millennium II
4MB SGRAM	4MB SGRAM	2MB SGRAM	4MB WRAM	2MB SGRAM	2MB SGRAM	4MB WRAM
None	None	15-inch	None	None	None	None
SB AWE64	SB-16	16 bit 3D	BTC 1853L 16-bit	16-bit wavetable	SB-16 compatible	SB AWE64
Quantum Fireball ST	Fujitsu	Quantum Fireball ST	Quantum Fireball ST	Quantum Fireball ST	Maxtor	Quantum Fireball ST
3.2GB UDMA	2.6GB EIDE	3.2GB UDMA	3.2GB UDMA	4.3GB UDMA	5.1GB EIDE	4.3GB UDMA
Panasonic 24X	NEC 24X	24X	BTC 24X	24X	24X	Panasonic 24X
None	None	56Kbps	USR 33.6Kbps	USR X2 56Kbps	USR X2 56Kbps	USR X2 56Kbps
Award	Award	IBM	Award	NEC	Phoenix	Award
Windows 95	Windows 95	Windows 95	Windows 95	Windows 95	Windows 95	Windows 95
Multimedia speakers LS-120 drive			Multimedia speakers			Multimedia speakers
164	205	170	183	162	N/A	214
330	350	303	333	317	N/A	372
208	218	N/A	206	169	N/A	228
191	205	177	187	160	N/A	208
220	227	205	222	190	N/A	249
181	208	177	N/A	145	N/A	215
206	220	N/A	N/A	173	N/A	231
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			$1,985	$2,499	$2,399	$2,305
$1,949		$2,699	$1,865			$2,095
$1,935	$1,688		$1,695			$1,990
2L, 2P	1L, 1P	1L, 1P	3L, 3P	1L, 1P	1L, 1P	2L, 2P

Overall

IBM Aptiva E25

The IBM Aptiva E25 is a great system to consider if you're into name brands. This machine offers you everything your customers will need, including a 15-inch IBM monitor and software to get you started right away. As well, the system is backed by an industrial giant, should any kind of service or support be required along the way.



Steve Halinda, Tim Bingham-Wallis and Jazz Bhooi are CCW's Lab Test Editors. They can be reached at (416) 535-8404.

Packard Bell Multimedia S615



Suggested Retail Price: $2,399

Reseller Authorization: Required

Demo Unit Availability: Yes

E-mail: pbcansupport@packardbell.com

Editors' Notes:
Packard Bell's latest offering is this S615, a machine loaded with great components and ready for work or play. Powered by a Pentium 233 MMX processor, 256KB of pipelined cache and 32MB of SDRAM, this system offers good performance and pricing for a system in its class. The hard drive in this system is a large 5.1GB Maxtor, which delivers plenty of performance, not to mention more than enough storage space. The video system consists of an ATI 3D Rage II+ video card with 2MB of SGRAM onboard. Multimedia accessories include a Sound Blaster 16 compatible sound card, and a 24X CD-ROM drive. To get your customer on-line right out of the box, this system also includes a USR X2 56Kbps modem.

Comtronic Premium System

Suggested Retail Price: $2,498

Street Price: $2,120

Reseller Price: $2,005

Service Depots:
Atlantic — Nova Scotia
Quebec — Montreal
Ontario — Thornhill, Hamilton, Ottawa.
B.C. — Vancouver

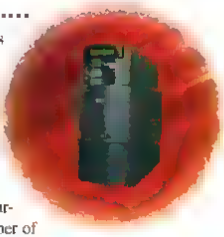
Support For Resellers:
Co-op advertising
Toll-free tie in to resellers
Web site includes technical information and drivers

Volume Discounts: Yes

E-mail: comax@arex.com

Editors' Notes:
This system has an Intel 233 MMX processor, backed by 512KB of pipelined cache on a 430VX motherboard. Configured with 32MB of EDO RAM, a 2.1GB hard drive from Western Digital and an ATI 3D Xpression+PC2TV video card with 4MB onboard, this system managed to achieve average performance on our benchmarks, held back slightly by the use of the aging 430VX chipset and slower EDO RAM. Rounding out the system is an Acer FX-3D sound card with onboard radio tuner, an A-Open 56Kbps voice/fax modem and a video conferencing kit. This system also comes with an EzKey EZ1000 programmable keyboard.

NEC Ready 9753



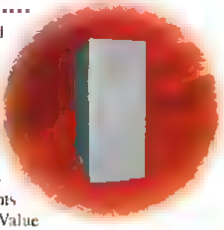
Suggested Retail Price: $2,499

Reseller Authorization: Required

Volume Discounts: Yes

Editors' Notes:
The Ready 9753 was the only system which had a charcoal grey case among all the machines this month. A very sleek-looking unit, it offers pretty much everything you would need in a family computer. It has a 233MMX processor from Intel, 256KB of pipelined cache, 32MB of SDRAM, a 4.3GB hard drive, a 24X CD-ROM drive, 16-bit sound system with wavetable surround sound and a U.S. Robotics X2 56Kbps fax modem. The ATI 3D Rage II+ video card with 2MB of SGRAM will help speed up games and the system as a whole. An interesting feature on this machine is the detachable media unit which contains the CD-ROM drive, floppy drive and a digital panel which shows the current date and time, as well as the number of fax and voice messages you have waiting.

Compucon



Street Price: $2,495

Reseller Authorization: Yes

Service Depots:
Alberta — Calgary
B.C. — Richmond

Volume Discounts: Yes

Demo Unit Availability And Restrictions:
Demo units are available to authorized Compucon dealers only

E-mail For Channel Use: sales@compucon.com

Editors' Notes:
The Compucon system used the new AMD K6-233 processor. With 512KB of pipelined cache and 32MB of SDRAM, it placed among the top machines. The system consists of a 2.1GB Ultra DMA hard drive, a very fast Leadtek WinFast 3D L2300 video card with 8MB of SGRAM onboard, a 56Kbps voice/fax modem, and an LS-120 floppy drive. Multimedia components include a Sound Blaster AWE64 Value sound card, a 24X CD-ROM drive and a pair of Rock-Excel 50W speakers.

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Get Out-Of-Country Medical Insurance

by Douglas Gray



If you and your employees travel out-of-country on business, be sure you're properly insured.

Do you go to the U.S. or overseas on business? If so, you could be facing financial devastation if you require emergency medical attention, unless you have the right travel insurance before you leave Canada.

The need for this extra insurance protection is simple. Provincial health insurance plans vary by province, but each provides you with the necessary protection when travelling within Canada. Coverage by provincial plans outside Canada is nominal, between $75 and $400 Canadian funds per day for hospital care, depending on what province you live in. This is very low compared to medical costs in the U.S.

The problem is that health care in the U.S. is very different from the Medicare coverage we are accustomed to in Canada. We are not accustomed to being personally billed, so we don't fully appreciate the real cost of treatment. In the U.S. system, private hospitals and doctors operate in a profit-oriented environment, and costs are much greater. In the U.S., the average hospital stay often exceeds US$1,500 per day, and can run as high as US$10,000 per day for intensive care. Certain emergency surgical operations can cost US$100,000 or more.

So who pays the shortfall if you have a medical emergency in the U.S.? You do. Unless, of course, you have wisely purchased supplemental medical insurance before you leave Canada, for the duration of your U.S. stay, be it a day or six months. Keep in mind this supplemental insurance covers emergency non-elective treatment for injury or illness only. It does not cover non-emergency treatment or services. It is not a substitute for Canadian Medicare.

Premium rates vary greatly between insurers. The rate depends on factors such as the nature of coverage, your age and existing medical condition, policy exclusions and limitations, the deductible portion of policy, whether you have a preferred (for healthy people) or standard rate plan, and the duration of your stay in the U.S. If you travel frequently — you may prefer to have a multi-trip plan, which will cover you for any number of trips outside Canada up to the number of days maximum each trip that you purchase — for example, from three days to 90 days.

Rates are normally set by the insurer between July and September each year for extended-stay coverage. For competitive reasons the insurer might drop the market rates after you have taken the policy out, but such a reduction should be passed on to you. Ask your agent. Do not choose a plan based on price alone but consider such factors as benefits, limitations, exclusions, and deductibles. Remember to claim your insurance premiums for a tax credit.

Adequate out-of-country insurance is necessary for your peace of mind and financial health. You need to know about and understand the various types of insurance. You need to take the time to do your research, so that you can make the right decisions to meet your needs and protect yourself and your employees from any potential risks.

It is also important to shop around for comparable rates and coverage. The insurance market is highly competitive, and you will find a considerable differences in price and in the quality of coverage offered by different insurance companies. CW

Take the time to do your research, so that you can make the right decisions to meet your needs and protect yourself and your employees from any potential risks.

Douglas Gray, LL.B., of Vancouver, formerly a practising lawyer is a columnist, speaker, and author of 15 business and personal finance books, including the "top 10" national best-seller, The Canadian Snowbird Guide, published by McGraw-Hill Ryerson, which includes more information on travel health insurance.

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Help Your Corporate Clients Plan For Disaster!

Businesses can minimize the danger to their information systems with a thorough disaster-recovery plan.

by Paul Luna



According to University of Toronto Earth and Environmental studies professor Arsalan Mohajer, Toronto may be hit with a major earthquake in the next 50 years. Mohajer, a geologist, has come to this conclusion after the discovery of a new geological fault on the bottom of lake Ontario.

Although a major earthquake has not occurred in the Toronto area in recent history, Mohajer says one may be a geological inevitability. Even if it is only a minor quake that cuts power and causes a few computers to fall off desktops (rather than toppling buildings), many companies in and around Toronto may never recover. Why? They don't have an information system disaster recovery plan in place.

For most companies, the timely and accurate collection, processing, and analysis of information is crucial to their success. Unfortunately, critical data can be lost in a matter of seconds if natural or technical disasters strike, or if security is breached and data is altered or destroyed.

"Fifty per cent of the companies that lose critical business systems for 10 or more days never recover. Ever," according to *PC Week* [February 6, 1996].

That being the case, it's surprising that most companies have non-existent or incomplete security systems or disaster recovery plans in place. And it's even more surprising that many resellers who sell client/server LANs and WANs, intranets and other distributive systems do not sell the insurance of disaster planning.

Disaster Planning Goes AWOL

Companies were not always unprepared for disasters. In the days of centralized information technology, when mainframes loomed large on the data landscape, disaster planning was the domain of the IS department. As mainframes evolved so did disaster plans: mirror locations of primary sites ensured businesses could continue to operate in the face of disaster, often without pause.

Systems were also more secure then. "The traditional approach to computer security was based on the assumption that security would be applied to one or a few mainframe computers," says Barry Lewis (lewisb@cerberus.com), an information processing security consultant and president of Toronto-based Cerberus ISC Inc. (http://www.cerberus.com).

Today, in the modern era of the distributed network jungle, centralized disaster planning has gone AWOL because effective data backup and disaster recovery is more complex in a distributive environment than in a mainframe environment.

Desktop computers and diverse networks in dozens of locations led to recently, a lack of mature software and hardware has made data back up and disaster recovery a labor-intensive task. Also, since the computer environment is now decentralized, many companies have not centralized security, data back-up and disaster planning.

Resellers: Serve Your Clients

If the resellers don't serve customers by providing information on security and disaster planning, then they are selling their clients short and missing golden opportunities to sell mission-critical value added services.

How critical are disaster recovery plans? Not being able to recover from a security breach or disaster can be extremely costly. Studies have shown that businesses average more than 400 computer outages per year lasting 24 hours or more. The average cost can range from $12 000 to $7.3 million per company per outage.

"The problem of recovering from a disaster in a highly distributed environment is one that has received too little attention," says Paul Mason, program director, enterprise systems management program at International Data Corp. in Framingham, Mass.



Scott Waterhouse, of Mainland Information Systems, an IBM business partner located in Calgary, concurs

However companies are becoming more aware of the importance of back-ups and disaster recovery planning, Waterhouse says

Lewis points to the growth of The Disaster Recovery Information Exchange (DRIE) — a non-profit organization dedicated to the promotion of business resumption planning, computer recovery planning and related disciplines — as an example of growing awareness With chapters in Toronto, Calgary Edmonton, Vancouver, Ottawa, Montreal and London, Ont., DRIE (http://www.drie.org) provides members, including resellers, with a forum for the exchange of information, educational activities and conferences covering LAN and WAN recovery, corporate-wide business continuity planning, emergency preparedness and, of course, data centre recovery planning

An Energetic Disaster Plan

When Suncor Energy Inc began looking for a cost-effective, single-vendor storage management solution to secure mission critical data on its multi-vendor network environment running business-critical applications, the Calgary-based energy company turned to Mainland Information Systems. "We delivered a robust, enterprise-wide storage management solution that provides automated back-up, data protection and disaster recovery services," says Waterhouse At the heart of the system is IBM's Distributed Storage Management Software (ADSM) An ADSM server provides back-up archive, and hierarchical storage management services for client network systems

Not only has the ADSM system made Suncor's data more secure and more recoverable, but it has reduced back-up times dramatically A Suncor Oracle database that would have taken four days to restore can now be restored in four hours with ADSM

ADSM storage management servers store and manage data on a variety of desktops, UNIX, mid range and mainframe platforms, performs back-up and archive services for more than 20 clients support HSM for IBM AIX and Novell NetWare platforms, and provide integrated on-line backup of popular databases

An Ounce Of Prevention

While disaster planning focusing on recovering data is crucial insurance, prevention can help companies avoid technical glitches that lead to disasters Resellers can help companies establish preventive maintenance plans which should define who has the authority to do

"Most companies do not have recovery plans in place. They are flying by the seat of their pants, doing user-intensive back-ups with little customization, if they're doing anything."

— Scott Waterhouse

what, and when work must be done and under what circumstances As well they can put in place comprehensive practices and procedures that can empower technical staff to work effectively within a framework of corporate and network priorities

Once a policy framework has been established, resellers can help network managers put in place methods for gathering technical data that helps them anticipate problems and, when problems occur, analyze what happened and why so recurring problems can be solved

In addition, resellers can help companies set up single-point-of-contact databases that contain information on how problems have been solved, so technical staff can avoid reinventing the wheel when problems reoccur — as they so often do

If vendors want to offer network managers third-party network management assistance, they should offer on-site consultation, multi-tiered support (available in required geographic areas), and strong relationships with hardware and software suppliers and telcos

When working with telecommunication companies, financial institutions, airlines or other large companies, resellers should look at selling clustering technology Clustering links together groups of computers running mission-critical applications on Unix and other platforms. High-availability cluster multi-processing (HACMP) technology is designed to maintain high dependability of applications and data servers for environments that cannot fail for any length of time — such as telephone companies' toll free systems airline reservation systems and electronic financial transactions

HACMP can prevent the loss of critical data by teaming up multiple servers to access the same data in parallel, plus it provides tools to install, configure and manage highly available environments

Ultimately as companies come to realize the importance of data stretched over disparate networks, they are demanding versatile, automated disaster recovery plans Resellers can work as business partners to deliver the solutions that large medium and small companies need to operate efficiently in the modern era of the distributed network

Paul Lima is a Toronto journalist who specializes in high technology. He can be reached at tiko@idirect.com

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The Next Generation?

Merced may take us across the 64-bit frontier

by Alan Zisman



Ready or not, 64-bit hardware and software is in your future.

The number of bits indicates the length of the data that your computer can deal with in a single gulp. Bigger numbers indicate more power. But while bigger ought to be better, it takes time for the industry to shift gears, and convert itself to work with a new, more powerful model. In fact, we're not fully shifted over from the last time it happened.

By 1985, Intel released its first 32-bit CPU, the 80386, which started to appear in computers a year or so later. But for a long time, 32-bit PCs were simply used as faster, more powerful ATs — niche 32 bit operating systems like OS/2 Version 2 and Windows NT (and various Unix variants) appeared in the early 1990s, but mass market acceptance of a 32-bit operating system waited for the mid-1995 release of Windows 95 (a product that still includes 16-bit code, for backward compatibility with older software). Even today, nearly 100 million computers are running Windows 3.1, forcing many software developers to create both 32-bit and 16-bit versions of their products.

32-bit is far from dead. CPUs descended from that original 386 include new model Pentiums, Pentium IIs, and equivalents which continue to appear from Intel and its competitors. But the writing is on the wall — 64-bit successors are under development, and this time, it looks like users won't be kept waiting a full decade for software that will take advantage of the additional power.

More relevant to PC manufacturers, vendors, and ultimately users are the plans of PC-chipmaker Intel. Intel has been quietly working on its own 64-bit generation, in alliance with Hewlett-Packard, code-named Merced. Details are only starting to appear.

Intel is referring to the design for Merced as IA-64, for 64-bit Intel Architecture, a successor to the current IA-32, found in the 386 and its follow-up models. The first models are expected sometime in 1999, produced on the still-to-be-built, 18-micron fabrication process. (Current cutting-edge chips are produced using .25-micron processes-smaller sizes makes it possible to stuff more transistors in smaller chip, allowing for faster speeds at lower heat and using less power.) Initially, sales of the chip will be targeted at high-end servers and workstations running NT or Unix. Intel is busy forming partnerships with many manufacturers planning to offer hardware based on this model with Dell, Compaq, Hitachi, and others.

So-called EPIC (Explicit Parallel Instruction Computing) technology, built into Merced will make it easier for manufacturers to design models using multiple Merced processors. HP, for example, is working on a series of UNIX servers, running as many as 256 Merced processors. The company's NT line will offer between four and 16 CPUs.

Merced's design gives a smaller percentage of the CPU for scheduling instructions — a function that takes about half of the power of current chips. This will make it possible to devote more of the chip for raw processing, but this will require a new generation of software compilers to build the scheduling right into the software, creating software that's already 'parallelized' — designed for multiple, parallel processing. This means a new generation of software will be required to take full advantage of Merced's capabilities. More intelligent scheduling will reduce bottlenecks found on machines currently featuring multiple processors. Running software designed for Merced will result in multiprocessor machines that are much more efficient than current models, not just faster. Expect to see computers that are far faster than current models, however. Clock speeds could receive a boost up to 1,000MHz or more. And that's not all. By 2001, Intel hopes to release a second-generation Merced, offering twice the performance of the initial models.

Another question mark, however, is can the required software compilers be produced on time (an equally complex development task)? Microsoft has announced 64-bit versions of NT and 64-bit compilers, hoping to have them available at the same time as Merced. These products will be backward compatible with today's 32-bit software.

But don't expect 32-bit software to run at warp speed. There will be a performance penalty for running it on a 64-bit system. Users wanting the fastest 32-bit performance will be better off running on a 'real' 32-bit processor. Intel and its competitors expect to continue to release improved descendants of their current models aimed at desktop and mobile computer users, even while high-end moves to Merced.

Merced won't be in your product line-up this year or next, but keep it in mind, and in your medium to long-term planning. CW

Alan Zisman is a computer journalist and teacher, living in Vancouver. He can be reached at azisman@rogers.wave.ca



by Newsbytes

Chinese seize fake CD-ROMs

Working on information provided by the Alliance Against CD ROM Theft (AACT), the Guangdong Administration for Industry and Commerce and the Beijing Fair Trade Bureau have raided more than 25 shops suspected of selling illegal CD-ROMs in the three largest software black markets in Guangdong Province.

The strike, believed to be the largest of its kind in Guangdong, was carried out by a team of more than 50 enforcement officers and led to the seizure of over 22,400 CD-ROMs, authorities say.

Guangdong is believed to have the largest concentration of software piracy operations in China.

"We recognize that the CD-ROMs seized are only a very small fraction of the number of illegal CD-ROMs on the market, but this is certainly a promising development," said Tom Robertson, AACT vice-president. "There is still a long way to go. Our goal is to get at the source of illegal production of CD-ROMs, and in the future we plan to target manufacturers of counterfeit CD-ROMs as well as retailers. We will continue to work closely with the Chinese officials and offer our support to assist them in stamping out the problem," he concluded.

The raids represent a new level of cooperation between AACT and the Chinese government.

Officials have promised to carry out frequent periodic inspections on retail outlets in an effort to maintain pressure on the illegal trade.

According to AACT, the majority of illegal CD-ROMs are produced in Southern China and illegally smuggled across the border into Hong Kong, where they are distributed throughout the region. Increasingly, however, production has begun in Macau and Hong Kong.

Singapore IT companies report optimistic outlook

The Singapore Federation Of The Computer Industry has announced the results of its *1997 Business Climate Survey*. It reports healthy performance for companies in 1996 and an optimistic outlook for the current and coming year, with the majority of companies planning both domestic and international expansion.

Reporting on performance in 1996, 73 per cent of companies surveyed said turnover increased against the previous year, with 15 per cent reporting falls and 12 per cent saying it remained unchanged. When asked about net profits, 55 per cent of companies had an increase against 1995, 27 per cent reported a fall and 18 per cent reported no change.

A healthy outlook for the domestic market this year was predicted by 83 per cent of companies, which expect growth, while 87 per cent say they expect growth in 1998. Based on this, 63 per cent said they will expand this year and 55 per cent said they had domestic expansion plans for 1998. Regarding the overseas market, 61 per cent have expansion plans for the current year and 89 per cent are looking to expand overseas next year.

The financial sector is expected to be one of the most profitable in 1998, with 62 per cent of companies saying they will concentrate on that sector, followed by the public sector and manufacturing sectors, 52 per cent, the communications sector, 44 per cent, and the wholesale and retail sector, 30 per cent.

The survey received responses from 76 of the SFCI's 190 members and was conducted in early September. A second follow-up survey was conducted after some of the recent financial market turmoil and received responses from 31 companies.

Hitachi licenses semiconductor core to Seiko Epson

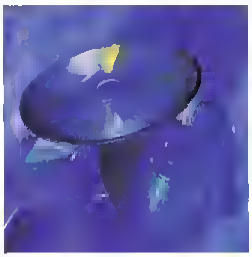
Hitachi Ltd has licensed its 32-bit SH-3 RISC microprocessor core to Seiko-Epson Corp. The company will combine its low-power semiconductor technology with the cores to produce new ASIC (application-specific integrated circuits) and ASSP (application-specific standard products) chips.

The agreement marks a further step in Hitachi's bid to make its 32-bit SuperH RISC engine family (SuperH) an industry standard. Seiko Epson is the first Japanese company to license the cores. Hitachi licensed SH-3 and SH-4 CPU core technology to VLSI Technology Inc. in 1996.

Samsung Electronics shows portable DVD-Video player

Following on from the unveiling of a portable DVD-Video player by Matsushita Electric Industrial Co Ltd, South Korea's Samsung Electronics Co Ltd has announced a similar portable player.

While revealing more about its product than Matsushita, which is still yet to come up with any specifications, Samsung has not revealed the most important number — the price tag.



The P-Theater is 200-mm long, 160-mm wide and 55-mm thick, according to the maker, and weighs 900 grams. Unlike the Matsushita player, which has a built-in 5.8-inch wide screen liquid crystal display, the Samsung unit comes with no display. Samsung suggests it be used with a television, monitor or, when taken outside, a head-mounted display.

Lithium-ion batteries can provide up to two hours of viewing from a full-charge.

The player accepts DVD-Video, Video-CD and Audio-CD discs and, when used with DVD discs, supports 4:3 or 16:9 aspect ratio images and 5.1 channel digital surround sound.

The company says it invested US$11 million in the development of the player which is expected to go into commercial production in the second half of next year.

McAfee Associates forms Korean joint anti-virus venture

McAfee Associates says it has agreed to form a joint venture with Seoul-based Dr Ahn's Anti-Virus Laboratories, Inc. to distribute its products in the Korean market.

The joint venture will integrate McAfee's network security and management technology with the V3 anti-virus products of Dr Ahn's Lab, Korea's leading anti-virus software producer.

New developments that will be available in South Korea under the joint venture, to be started before the end of the year, include an integrated, native Korean software suite of products. CCW

Rushing Headlong Into High-Tech



by Graeme Bennett



As many Canadians are aware, *CBC Radio* recently discussed the issue of computers in the schools, and questioned whether in fact computers are as worthwhile an investment as we've been led to believe. Are the huge investments paying off, or are we churning out desocialized, disaffected nerds? In essence, the story stated that schools are rushing headlong into high-tech without really thinking about what good it will do or without contemplating its effects.

As one of the many hats I wear, I am a teacher for the Vancouver Night School program and have taught professionally for over a decade.

Poor Purchase Patterns

First, I couldn't agree more with the assertion that schools in general don't make the best purchase decisions. I've seen too many badly configured networks, D grade monitors on the blink and non-upgradeable PCs and Macs languishing in under-utilized or otherwise dysfunctional labs to believe that the people in charge of purchasing are getting solid advice from their tech advisors. However, this isn't the biggest problem.

My main complaint is the narrow world-view that produces labs full of all one kind of PC or one kind of Mac. The world isn't like that, and the only people a single-platform classroom serves are the system administrators who find all-the-same system configurations easier to manage. (And I acknowledge the dilemma that VARs face when they are asked to bid on systems. They often feel forced into basing quotes on second- or third-tier hardware in order to price their bids competitively, and the luxury of more-manageable, auto-configurable, or otherwise "smart" components just isn't allowed, due to price or legacy-system-imposed restrictions and constraints.)

The notion of having everyone using the same hardware doesn't reflect the kind of real-world experience we should be bringing to users, whether they are children in school or employees in the typical corporate environment. In the business world or at home, different members of the community have — and should be encouraged to explore — different interests. Those inclined toward graphics or multimedia or music might enjoy a Mac, or they might enjoy a PC, but they shouldn't be forced in Borg-like fashion, into a world where assimilation is the only option.

The Blackboard Benefit

Another of the statements made on *CBC Radio* was to the effect that students actually like it when they learn hypertext on a blackboard instead of a computer. I happen to agree that, often, "high-tech" education forsakes underlying principles for tool-oriented techniques, as might be exemplified by the all-too-common scenario where a desktop publishing class is taught PageMaker or QuarkXPress before they learn principles of typography and design — and it's wrong!

Unfortunately, today's media-saturated, short-attention-span culture seems to have produced students that have taken the Nike slogan as a lifestyle vow: *Just Do It*. Hence, today's teachers must be ever more creative in the construction of projects and assignments that serve the "principles first" approach while still allowing students to stave off the boredom of rote repetition and other old-school style learning systems.

Of course, this applies not just to students, but also to employees and customers alike. In an instant gratification society, people want to see rapid results, and they like rewards. I'd like to see more retailers, educators and in-house technological evangelists better exploit the educational opportunities and potential interest that can be generated by distributing and encouraging their users to explore a few of the many trialware and demo versions of software packages now available. The average user doesn't even know these packages exist, nevermind the fact that a fully functional trial version is often available for download from the Internet. The retailer, VAR or educator who can download the cream of the crop and pre-test the items, and then help build interesting new curricula around them, is sure to see benefits in terms of interest. And, with a little luck and exploratory work, these freely available new tools can inspire greater interest, provide new capabilities and stretch thin budgets.

This can also provide a pathway to continued relationships with those who have fallen — either temporarily or permanently — off the "upgrade bandwagon." There are those who, for reasons of budget, functionality or other constraints, view their current setups as sufficient for the foreseeable future. There are actually people out there who like DOS, and whether you like Windows or Mac or some other less mainstream platform, some people prefer an alternative.

It is the context that adds value. In the post-industrial age, we're not supposed to be cranking out little assembly-line workers, we're supposed to be preparing them for the real world. And that means choice. If my child wants to use a computer and yours doesn't, the curriculum should be flexible enough to support both.

Feed The Information-Hungry

For all those techno-Luddites who decry computer based training as producing a generation of isolated, disaffected and desocialized young adults, I say humbug. The intrapersonal computing revolution of the last four years has increased the interactivity of the networked computer to the point that the Internet is practically a societal central nervous system. Encouraging students to research and explore the vast resources of this global system is as valid a social study as anything I learned in school. CCW

Graeme Bennett is the Senior Editor of The Computer Paper and a former computer retailer. He can be reached at graeme@tcp.ca.

new PRODUCTS

NCR intros rackmount server

NCR has announced the WorldMark 4300 Rack Mount Server for customers who need centralized computing and efficient space usage.

The product is targeted at server consolidation or departmental datamarts. It consists of a 19-inch wide by 77-inch high rack cabinet that accommodates a variety of subsystems: the WorldMark 4300 computing node, NCR 6210 and 6250 disk arrays, UPS and console switches. The NCR WorldMark 4300 Rack node supports one to four Pentium Pro 166MHz or 200MHz processors with dual peer PCI I/O channels, six hot-pluggable drives for up to 24GB of storage, has six PCI and four EISA slots with memory expansion of up to 4GB. Pricing starts at $50,000. See http://www.ncr.com



US Electronics markets wireless keyboard

US Electronics, of Port Jefferson Station, NY, has introduced the SurfMate Wireless Keyboard for Window 3.x or Windows 95, with a suggested retail price of US$149.

The user plugs SurfMate's receiver unit into the PC's keyport port and then the 79-key wireless keyboard is functional.

The product transmits at up to 45 feet from the computer. It weighs 21 ounces, including batteries.

See http://www.surfmate.com



SurfMate Wireless Keyboard

Lexmark Canada announces 7200 Color Jetprinter

Lexmark Canada Inc. has launched the Lexmark 7200 Color Jetprinter.



Lexmark 7200 color Jetprinter

The product incorporates Lexmark's EX2 technology, and has a street price of $549. It includes a number of improvements, such as a six-color printing option for photographic-quality prints, and heavier printer construction to reduce banding and improve print quality by more accurate dot placement.

IBM preps for Christmas giving with slew of products

IBM's PC company is offering a wide range of software, peripherals and consumer and small office PC systems for the holiday season, ranging in price from $39.95 to $4,399.

At the stocking stuffer level is the IBM Brings You The Crayola Kids Adventures Color a Story In 3D program, a multimedia kids' 'edutainment' title that lets users create 3D images based on themes suggested by *Gulliver's Travels*, *20,000 Leagues Under The Sea*, and *The Iliad* (the tale of The Trojan Horse). The appealing graphics of this Windows title are enhanced by music and voice storytelling elements. Additionally, the IBM Brings You Crayola Magic Wardrobe is a computerized paper dolls program that includes examples from Elizabethan England to Navajo Indians, and IBM Brings You Crayola Print Factory, a PrintShop style program for creating banners and stationery. These two products are in dual Mac and Windows format. All three programs have a suggested list price of $39.95.

For safer computing, the IBM AntiVirus program offers up-to-date protection against common viruses, including the Microsoft Word macro viruses, and other viruses that can be transmitted via the Internet. The price is $69.95.

For those who would like to emulate Bill Gates' new 'smart' electronic house on a slightly more modest level, the IBM Home Director program, for $139, offers the ability to control heating, lighting and electrical appliances automatically, or from your home computer, or from a remote location.

IBM is entering the new 'scrolling zooming' mouse market with its new ScrollPoint Mouse, a device which exploits the added mouse support contained within Windows 95. The ScrollPoint, for $92, is designed to allow users "to easily surf the Internet, and quickly navigate through long documents and spreadsheets, eliminating most use of scroll bars. For more information, see http://www.ca.pc.ibm.com.

Toshiba of Canada adds Tecra 750DVD 233MHz notebook

On Nov. 3, Toshiba of Canada, Information Systems Division, announced its latest version of the Tecra notebook series, the model 750DVD.

This new notebook is based on the Intel 233MHz processor, with 64MB of RAM, a 5.1GB hard drive, a built-in videoconferencing kit, MPEG-2 digital video decoder hardware, and a user-swappable DVD-ROM drive. According to Robert Grossman, vice-president and general manager of Toshiba of Canada ISG, "We have introduced substantial upgraded to our notebooks in the past and unveiled leading edge products, but this lineup is truly unprecedented and extraordinary." The new model of Tecra 750DVD has a suggested price of $9,129.



Toshiba 750 DVD

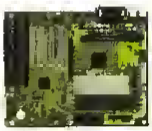
For more information, contact http://www.toshiba.com.

EPoX International adds i440LX motherboard

EPoX International has released its i440LX based motherboard — the KP6-LA.

The board's features include:

- Polyswitch — an intelligent circuit breaker that protects the motherboard and system components from shorts and power overloads,
- The Easy Single Setting Jumper for easy configuration,
- 1GB memory capacity,
- Intel's LanDesk Client Manager (LDCM) software,
- Timed Power ON — for power on without intervention, and,
- Power loss recovery capability.



EPoX i440LX motherboard

Call (714) 990-8858, or see http://www.epox.com. CW



HP makes senior appointments

Hewlett-Packard (Canada) Ltd has named Paul Tsaparis and Pierre Montmartin as vice-presidents of HP's Computer Organization in Canada.

Within that organization, Tsaparis will lead the team which provides business solutions to large enterprises.

Montmartin will lead the team responsible for HP's relationships with business partners in channel development, distribution, sales and marketing.

Tasparis brings more than 13 years of HP marketing, sales management and professional services experience to the position. He was most recently general manager of HP's Professional Services organization.

Montmartin joined HP in 1981 in the Medical Products Group. He was most recently business manager, general distribution for HP Middle East and Africa. He succeeds Bob McDevitt, vice-president and general manager, personal computer products. He will retire in December, after 25 years with HP.

Compaq Canada announces new product managers

Richmond Hill, Ont.-based Compaq Canada Inc. has appointed Christian Chabbal as notebook product manager and Ian Williams as enterprise options product manager for the company.


Ian Williams

Chabbal will be responsible for the development, implementation and management of Compaq's Armada notebook business in Canada. That includes product announcements, pricing, demand generation activities and customer satisfaction.


Christian Chabbal

Williams will have similar responsibilities for Compaq's enterprise options business in Canada.

Chabbal was previously enterprise options product manager, since August 1995. Former product manager Eric Dubois is now a channel account manager for Compaq.

Develcon names directors

Develcon Electronics Ltd., of Saskatoon, has appointed John Douglas Bailey and Jeremy Posner as directors of the company.

Bailey has more than 30 years of high-tech management, sales and marketing experience in roles at IBM Canada Ltd., Canada Systems Group, Storage Data Technology Inc., National Semiconductor (Canada) Inc. and DSC Communications Canada. He was most recently president of Vancouver's Epic Data.

Posner was a director of EDA Instruments Inc., from 1990 until its sale to Develcon in 1996. He has degrees in law and business and had extensive experience in corporate finance, business development and acquisitions.

Develcon develops networking solutions, including frame relay, ISDN, LAN and voice technologies.

InterSystems chooses health, government executive

InterSystems Corp. has appointed Glenn D. Pulling to direct sales initiatives in the healthcare and government sectors throughout North America, as vice-president of North American sales, healthcare and government industries.

He will oversee the InterSystems sales team and have lead responsibility for sales strategy, new sales and third-party agreements for InterSystems' DBMS software products.

For the past 10 years, he was regional vice-president of sales for Banyan Systems, and has more than 20 years of IT-specific sales experience.

Maxtor names three execs to sales/marketing

(NB) — Maxtor Corp. has appointed three executives to its sales and marketing organization: Bill Almon Jr., Pat Ridley, Fernando Corona.

Almon Jr. has been appointed vice president worldwide marketing. He joins Maxtor from Integral Peripherals, where he was most recently vice-president of worldwide sales and marketing.

Ridley has been appointed senior director, sales operations. Ridley was with Cirrus Logic for eight years, where she was most recently optical storage operations manager. She was also at Intel Corp. for 17 years.

Corona has been appointed director, Pan-American distribution and Latin American sales. Corona was with Allied Telesyn International, where he was vice-president of marketing. Prior to that, he was six years at Western Digital Corp. CCW

CALENDAR

Dec. 2-3 — **The IT Outsourcing Conference**
Orlando Flor.
http://www.dci.com

Dec. 9-11 — **DCI's Database & Client/Server World**
Chicago
http://www.dci.com

Dec. 9-11 — **Comdex/Miami '97**
Miami Beach Flor.
http://www.comdex.com

Calgary — Dec. 16-17
Vancouver — Dec. 17-18 — **Rapid Requirements Using Business Rules**
PowerPlus Canada Inc.
Call 1 800-268 8706
http://www.powerplus-gbrt.com

Jan. 20-22 — **Comdex/PacRim '98**
Vancouver
http://www.comdex.com

Feb. 13-15 — **Computerfest (Winter) & Mac Expo '98**
Toronto
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Fax (416) 925 7701
E-mail dcartel@compfest.com

Feb. 18-20, 1998 — **The Second Annual Mobile & PDA Expo**
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http://www.pda-expo.com

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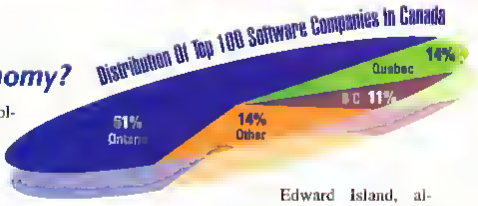


Nifty Numbers

Report from Branham

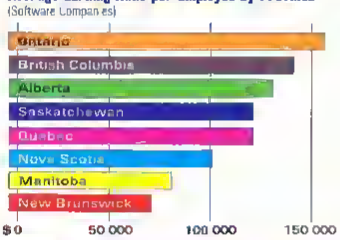
Who's the best?

Can Canada be competitive in a global economy?



In Canada, where the population is geographically dispersed across a large area, regional differences within the country are almost as significant as the differences between Canada and other nations. It is therefore useful to analyse our software industry from a regional perspective. Although Canada's software industry is increasingly viewed as a major force in the international market, much of this success is focused in a few locations.

The largest concentration of Canada's top 100 software companies is headquartered in Ontario, which is host to more than 60 per cent of the country's top earning software vendors.



Quebec and British Columbia follow, with 14 per cent and 11 per cent respectively. This is primarily explained by the fact that these provinces also have the highest populations. However the existence of educational institutions, R&D facilities and government agencies have also played a role in the development of these areas as major software centres. For example, Ontario's University of Waterloo and B.C.'s University of British Columbia have developed reputations for creating innovative spin-off companies.

Once again, the higher earning ratios tend to be concentrated in those provinces with the higher proportion of population. This fact may be attributed to a higher local customer base and greater access to skilled employees. Quebec is an exception, having one of the highest populations, and greatest number of software companies, but placing fifth after Ontario, British Columbia, Alberta and Saskatchewan in terms of earning ratios.

As we move to a more global economy, locating in major urban centres will not play as strong a role in a company's success. Prince Edward Island, although at present having no companies in the top 100, is becoming increasingly appealing as a headquarters location, due to the positive lifestyle options it offers. Newfoundland has the potential to position itself as a gateway for European companies to enter the North American market.

Among industry analysts the commonly accepted average earning ratio for software companies is estimated at $100,000 per employee. Overall, Canada is matching and surpassing these numbers, with five provinces having an average earning ratio of more than $100,000 for 1996. CCW

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VOICE YOUR OPINION

Reader Poll

Last Issue, we asked:

Given tight competition, yet some indications of a strengthening economy, what are your impressions of the health of the overall IT industry, at the end of 1997, compared to the previous year?

You said:

87% The industry is very strong and healthy, experiencing lots of positive growth compared to last year

8% Business in the industry is much the same as last year

25% With more consolidation, players are being squeezed and knocked off. This business is getting tougher

17% My business is doing more or less similar volumes of business to last year, with similar profits

8% Profits have slide, due to shrinking margins and increasing competition in the market-place, compared to 1996

For purposes of our survey, how do you describe 1997 profitability and health at your business, compared to 1996?

You said:

75% My business is growing positively, seeing new opportunities, markets and greater demand

This Issue, our question to you:

What impact is Electronic Commerce having on your revenues?

Please indicate which most closely reflects your view:

- ☐ I attribute revenue increases directly to electronic commerce
- ☐ I don't see any measurable effect on my business revenues, due to electronic commerce
- ☐ Electronic commerce, with the additional competition it brings, is having a negative effect on my business

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Track Density	6,132	5,932	6,000	6,500	8,000
Average Seek Time (ms)	10	10	10	10	11
Data Transfer Rates					
PIO Mode 4 (MB/sec)	16.6	16.6	16.6	16.6	16.6
Ultra DMA (MB/sec)					33.3
Buffer Size (KB)	128	128	128	128	128
Rotational Speed (RPM)	4,500	4,500	4,500	5,400	5,400
MTBF (hours)	500,000	500,000	500,000	500,000	500,000

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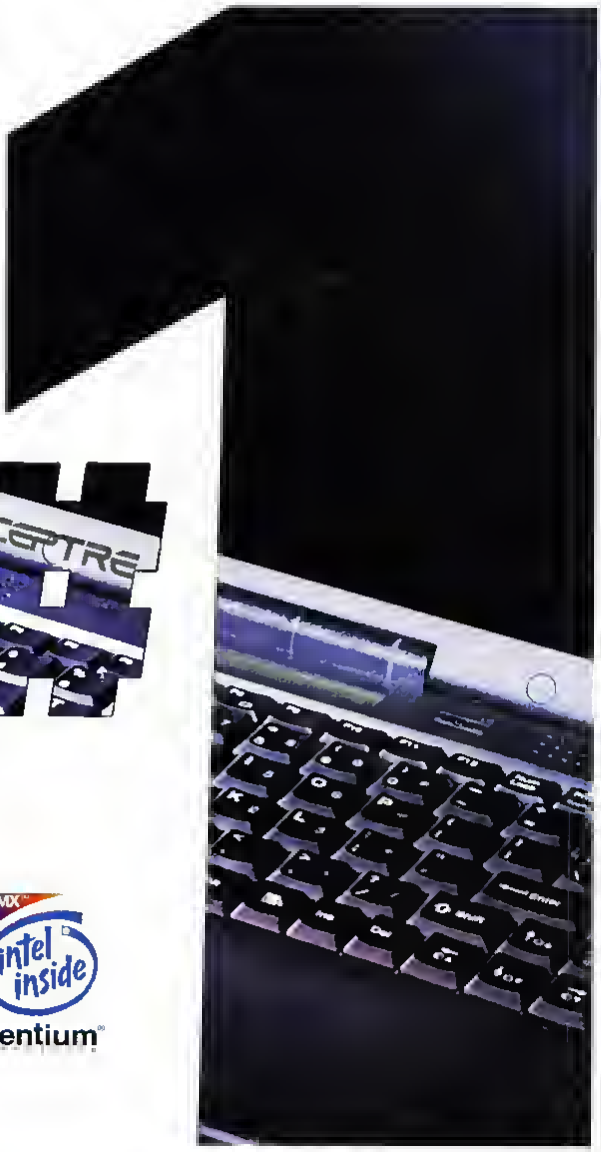
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NSTL PC Digest, September 1997

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